

PATENTS
AND THE
USEFUL ARTS

H. HOWSON

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TO THE
HON. ELLIS SPEAR,
(Commissioner of Patents,)

This little volume is inscribed, as a mark of respect,
by the author.

PATENTS AND THE USEFUL ARTS.

INTRODUCTION.

IF the reader feels inclined to smile at the title chosen for this little work, and to doubt the existence of any very intimate alliance between patents and the advancement of the useful arts, I ask him to follow me while I take a rapid survey of the rise and progress of those arts since the latter part of the reign of James I., and note their connection with patents.

The reader need not be alarmed; I shall take long and rapid strides, and shall, as far as the task before me will permit, avoid tedious historical particulars and tiresome statistics; and as I proceed shall make an effort to entertain the reader, hoping at the same time to impart information of an interesting character on a subject concerning which there has recently been much discussion among thinking men.

I propose in the first instance to note in a sketchy and conversational way, and without any attempt at thoroughness of detail, some of the prominent steps in the history and progress of three controlling branches of industry, the steam-engine, and textile and iron manufactures, from the time I have mentioned to the year 1800 ; referring, as I proceed, to a few of the many

patents which give us the best, and in many cases the only, clue to that progress.

It has been deemed best to treat, in the outset, of the origin and growth of patent systems up to a time (the year 1800) when such systems had ceased to be experiments, and when their effect as stimulants of ingenuity had been determined.

I propose in the second place to refer briefly and in very general terms to the progress of the industrial arts in our own country, and to its connection with patents from the year 1800 to the present time; and shall conclude with a few remarks about inventors, the present condition and defects of our patent system, and shall venture to suggest how easily these defects may be remedied without detracting from the beneficial vitality of the system.

I have only to hope that the reader who has the patience to peruse the following pages may conclude that patents and patent matters do not present so dry and uninteresting a subject as is generally supposed.

H. H.

I.

EARLY PRACTICAL SCIENCE AND EARLY PATENTS.

I SHALL not dwell long on the period which forms my starting-point, the reign of James I.

In this reign lived two prominent men who were indirectly connected with patents: Lord Bacon, "the wisest and brightest of men;" and the king himself, who, according to Macaulay, was alternately a "buffoon and a pedagogue." Bacon, the father of modern philosophy, taught the world that science was no longer to be devoted to occult researches or to the amusement of the rich; "that study, instead of employing itself in wearisome and sterile speculations, should be engaged in mastering the secrets of nature and life, and applying them to human use."

There were intellectual giants in those days,—Bacon, Galileo, Descartes, and other fathers of applied science.

Queen Elizabeth had taken upon herself to grant, or rather to sell, patents of monopolies by the score, with the view of enriching her favorites; to such an extent had this been carried, that iron, coal, vinegar, oil, saltpetre, lead, starch, yarns, skins, leather, glass, and other commodities, could be purchased only at most exorbitant prices.

These practices were opposed by the House of Commons with such urgency and determination that the Queen had the good sense to abandon the prerogatives which she had assumed,—a wise example, which was lost on her successor, James, whose profligacy, unjust taxation, and sale of monopolies, insulted Parliament, and raised in the House of Commons a sturdy opposition.

As the barons of 1215 compelled the tyrannical John to sign the Magna Charta, so the Commons compelled King James to assent to the statute abolishing monopolies.

This famous statute declared “all monopolies theretofore granted, or thereafter to be granted, of or for the sole buying, selling, making, working, or using of anything within the realm, contrary to law, and utterly void and of no effect.”

But from this wholesale condemnation the act excepted “letters patent, for limited periods, of the sole working or making of any manner of new manufactures within the realm, to the true and first inventor or inventors of such manufactures, which others at the time of making such letters and grants shall not use.”

This mention of patents of monopoly in the same statute with patents of invention was an unfortunate incident for generations of inventors. It engendered in the minds of the public an association of patents with monopolies, which prevails to this day; and as more or less odium is attached to the word “monopoly”

wherever the English language is spoken, the word "patent" shares a part of that odium.

It is a pity that the framers of the statute of monopolies did not abandon the word "patent" in referring to the document which establishes the inventor's temporary right to the production of his brains, and adopt some other name. It is to be regretted that in after years the framers of our act of 1790 did not invent a new name.

It is too late now to change it, but it is not too late to denounce the every-day association of patents with monopolies.

Whenever a legislator denounces our patent system, he always alludes to patents as monopolies, using this word in its most odious sense; whereas the truth is that a patentee is paid by the people for the services which he renders. If his invention meets the public demands, the public buy it; very rarely he gets more than it is worth, generally less.

Our neighbor has a well-stocked farm, the products of which are due to his industry and intelligence. He takes the products to the market and offers them for sale to the public; he is as much of a monopolist of these products as the inventor is of the results of his intellectual labors, his patent.

Let us have no more of this illegitimate alliance between patents and monopolies.

Before I leave the times of James I., who appears to have been engaged during his whole reign in sharpening the axe which removed his son's head, and in preparing the Anglo-Saxon mind for the abandon-

ment of all ideas of the divine right of kings, I must not forget the sturdy men who, to use Canning's words, "turned to the new world to redress the balance of the old," and landed on the barren coasts of New England two hundred and fifty years ago. Their descendants, living under a liberal government, and protected by a wise patent system, have startled the world with their ingenuity, have contributed to the welfare and convenience of mankind by their endless inventions, and, with the many ingenious and enterprising men of other parts of our country, are destined to endow the United States with manufacturing supremacy, if unwise patent legislation does not remove the incentive to invent.

Let us pass to the year 1660 and to the reign of Charles II. . .

"Bacon had sown the good seed in sluggish soil and in ungenial season. He had not expected an early crop, and in his last testament had solemnly bequeathed his fame to the next age."

"During a whole generation his philosophy had, amidst tumults, wars and prosecutions, been slowly ripening in a few well-constituted minds."

In the year 1660 the Royal Society, "destined to be the chief agent in a long series of glorious and salutary reforms, began to exist, and in a few months experimental science became all the mode."

"The spirit of Francis Bacon was abroad. There was a strong persuasion that the whole world was full

of secrets of high moment to the happiness of man, and that man had, by his Maker, been entrusted with the key which, rightly used, would give access to them."

"There was at the same time a conviction that in physics it was impossible to arrive at the knowledge of the general laws, except by the careful observation of particular facts."

Some of the early investigations of the Royal Society were of curious character. The production of perfect sea-fowl from barnacles, as described and illustrated in Girard's *Herbalist*, in 1636, and the fish that turns to the wind when suspended by a thread, were solemnly discussed.

The question was raised as to whether a given quantity of water would weigh more with a fish in it than without the fish; and after a heated discussion, one member suggested the advisability of determining the question by the aid of a pair of scales, a bucket of water, and a fish. Practical man! he should have, flourished in more practical times.

It became the fashion with the nobility and gentry and even for the king, to attend the meetings of the Royal Society at Gresham College.

The old gossip Pepys, who was to be found wherever people of fashion congregated, gives us in his Diary some glimpses of the proceedings of the Royal Society at Gresham College.

He tells us how the king, Charles II., "mighty laughed" because the members, on one occasion, "spent their time in the weighing of ayre, and doing nothing else, while they sat."

On another occasion he went with the fashionables to see an experiment with a new musical instrument "which played so badly and harsh that it would never do, and after three hours' stay could not be fixed in tune." On another occasion he refers to a discourse on witches, which, he says, "was well writ, but not very convincing."

If we feel inclined to laugh at some of the early proceedings of the Royal Society, let us bear in mind that, a century later, the wisest men in Europe were humbugged by the arch impostor Cagliostro; that there are to-day thousands of firm believers in the sacred gold plates, which Joe Smith, the Mormon, declared he had received from an angel. We cannot well afford to laugh at our ancestors, for, in these days, believers in impossible motors and the materialization of spirits are quite common.

While the king laughed at what he looked upon as the antics of silly philosophers, at the meetings of the Royal Society, there were serious men at work there on serious things,—great men, such as Newton, Wren, Flamsted, Boyle, and many others, who, in obedience to Lord Bacon's teachings, laid the foundation for that progress in the useful arts which was soon to startle the world.

In the times of which I am writing, literature had reached an exalted condition, for Shakespeare, Bacon and Milton had written, the fine arts, painting, sculpture and architecture had flourished; but there was to be a new phase of society, in which the efforts of learned men were to be directed to the practical development

of science for the well-being of mankind and the rapid advancement of civilization, and the dawn of this new era was signalized by the first meetings, in 1660, of the Royal Society in the little lecture-room in Gresham Street.

But what has all this to do with patents, the reader may say?

Among those who attended the meetings of this association were several patentees, two of whom are better remembered at this day than the rest,—Prince Rupert and the Marquis of Worcester; the former a cousin of the King, a brave soldier and a bad general, but for whose rashness Charles I. might have turned the world back on its hinges, saving his head and recovering his throne.

Prince Rupert spent the last and most useful years of his life in practical experiments. He was the inventor of mezzotint engraving; and he obtained a patent, the one hundred and sixty-first under the statute of monopolies, for the manufacture of steel, and a second patent to enable him to swear his workmen to secrecy,—for the government at that time had not adopted the true policy of compelling an inventor to disclose his invention before granting a patent, and hence the efforts of Prince Rupert in this important manufacture have been lost to the world.

A much more prominent man as an inventor was the Marquis of Worcester, the author of the “Century of Inventions,” published in 1663. Mr. Dircks, the eminent biographer of the Marquis, says “he was the first to evoke that Titanic power which through successive

improvements, consequent on the accumulated ingenuity of two hundred years, has given to the present age the modern steam-engine."

Mr. Holt, formerly Commissioner of Patents, in his decision in the Goodyear extension case said: "On all the hearthstones of the civilized world, for thousands of years, the kettle had boiled, and lifted its lid by the power of its steam; yet for none had this seemingly trite and ever-recurring incident been significant, to none had it announced that measureless power of which it was the humble but distinct exponent. At length it caught the eye of a lonely student of nature, a prisoner in the Tower of London (the Marquis of Worcester); and in the soil of his prolific mind it proved the rapidly expanding germ of that steam-engine whose triumphs have changed the social, political and commercial aspects of the globe."

Worcester's patent was the one hundred and thirty-first under the statute of monopolies, and was granted February 8, 1661, for a rather incongruous collection of inventions.

II.

INVENTORS AND THEIR MOTIVES.

It will be noted that these early originators, the most prominent inventors of the times in which they lived, were not idle speculators, like the alchemists and astrologers, content with observing the results of their efforts; they were not vain men content with the notoriety due to the development of their inventions. Doubtless sensitive enough as to their claims to originality, they looked beyond all this: they looked to the pecuniary reward due them from the public which profited by their intellectual efforts.

Let us stand for a moment in the English House of Commons, in the year 1875. A patent abolitionist has the floor, and he is declaring that "notoriety is a sufficient reward for inventors,"—a silly, short-sighted remark for a legislator to make in these enlightened days: a remark only equaled in stupidity by that of the Dutch politician, who declared, a few years ago, that patents might be serviceable enough in such countries as the United States and England, but were useless in a country which had reached such a state of perfection as Holland.

The English member of Parliament should have gone a little farther, and told us how to keep men alive on notoriety, as a diet.

There never was a true inventor or originator who was content with glory as his sole reward ; there never will be such an inventor.

There are records of instances in which men, with a profusion of sentiment and ostentation, have dedicated alleged inventions to the public ; but a close investigation of such cases will always bring to light one of two things,—either the claim of the giver to the invention was based on a very flimsy foundation or the invention was worth nothing.

True inventors are practical men, not dreamers,—men who put their ideas into definite and useful shape. This always costs much time and labor, and generally—if not always—money. Such men, therefore, cannot afford to content themselves with “glory” as the reward of their labors ; they look for something much more substantial. With them invention means work, very serious time and thought consuming work, in which they are sustained by the hope of future profit, proportioned to their present expense.

It is not with those men alone whom we know as inventors that this is the case ; it is the same with all true originators. The author who invented as many original characters as any author before him, Charles Dickens, was quite as sensitive about the money value of his works as about his claim to their originality.

The artist does not paint pictures for reputation alone, he looks for remuneration commensurate with his reputation.

Ask the new composer how he feels on the night when the success of his new opera is assured. He will

first express his gratification at the reputation he has acquired; but his second thoughts will be directed to his family, and to the additional comforts which his sudden reputation assures them.

Who ever heard of a general so tickled with the success of his ingenious tactics, or a member of Congress so delighted with the originality of his speech, as to forget to demand his pay?

It has been alleged by those who have acquired a habit of denouncing patents, that inventors will continue to invent, patents or no patents. If these men mean that inventors will continue to think, and that visions of new things will continue to haunt the minds of originators in the absence of prospective rewards, I agree with them; but if they mean that solid inventions, by which alone the country can be benefited, will continue to be made in the absence of a prospect of reward to the inventor, I say that these men are endowed with too limited a knowledge of human nature to give an opinion worth listening to.

Thoughts of new things, visions of original ideas, always existed and always will exist in the minds of originators; but these cannot be converted into inventions without remuneration.

The inventors of to-day are actuated by precisely the same feelings as were Prince Rupert and the Marquis of Worcester two hundred years ago; they look to the reward to be acquired through the medium of their patents.

We shall see presently what an important part the English patent system, bad enough as it was,

played in encouraging inventors, and stimulating the progress of the useful arts, and how the inventors of our own country have outstripped all others, owing to the most just and liberal patent-system in the world.

It would be well for our legislators, who feel a disposition to tinker the patent laws, to look carefully into all this; for any fatal wounding of the system due to under-estimation of the intellectual labor of our inventors will be a blow at the progress of our industries, and at the advancement of our civilization.

A nation in which progress of the industrial arts has ceased, is going backwards; if we want our national industrial prosperity to continue, we must have new inventions; and to get new inventions we must pay for them, as we must pay for everything worth having; and the payment we make to the inventor in the shape of a patent is the fairest of all payments.

III.

THE STEAM-ENGINE—EARLY PATENTEES.

LET us turn to the reign of William III., 1689–1701. James II., the last, and perhaps the worst, of the Stuarts, had been driven out of the country to make way for a man of brains, who became the head of the government under a constitution, which was placed on a firm basis.

One of the most prominent inventors of this reign was Thomas Savery, whose patent “for raising water and giving motion to millwork by the impellent force of fire, useful for draining mines, serving towns with water, and working all kinds of mills in cases where there is neither water nor constant wind,” had been granted July 25, 1698.

Savery was a man of great ingenuity, energy, and daring. His predecessor, the Marquis of Worcester, had been the victim of religious persecution, had been robbed of his estates, hooted at as a madman, and imprisoned in the Tower of London. But Savery lived in better times; although subjected to sneers and insults, he had the Royal Society, with Newton as president, and even the king himself, to encourage him. His efforts resulted in practical success, his steam-

engine did the promised duty ; and this was, of course, followed by the detractions of the envious, and the plundering schemes of pirates. But his courage surmounted all obstacles ; and the name of Savery has been handed down to us as the most ingenious, persevering, and successful inventor of his day.

Human nature has not changed since Savery's time. The inventor of to-day, whatever his talents may be, must be enterprising, daring, and self-asserting, if he wishes to succeed.

Let us cross over to France, and note what was doing there in the way of steam-engineering in these times, under Louis the XIV., concerning whose character there has always existed much difference of opinion. Buckle in his "History of Civilization" says : "The reign of Louis XIV. must be utterly condemned if it is tried even by the lowest standard of morals, of honor, or of interest. A coarse and unbridled profligacy, followed by the meanest and most groveling superstition, characterized his private life."

That the useful arts could make no material progress under a warlike, priest-ridden despot is demonstrated by what we know of the life of the celebrated inventor Papin, a contemporary of, and a much more scientific man than Savery. Papin was, undoubtedly, the inventor of the safety-valve ; and recent investigations have brought to light the fact that he was in advance of Savery in many particulars.

But where was the encouragement in France for such a man as Papin? Artists, and literary men, and the makers of pretty toys, were encouraged by the lofty patronage of the king and nobility, but solid improvements in the useful arts were neglected. Such things as patents were unknown.

Papin visited England for a short time, and attended the meetings of the Royal Society, after which he returned to France to be driven out by religious persecution, and to seek refuge in Germany, where he received more encouragement, and where, in 1690, he published his first work, in which he proposed steam as a universal motive-power. Papin was not only a great inventor, but, like all truly great men, was honest and candid; for he gave to Savery the credit of being an independent and original inventor.

Had Papin continued to live in England, where, in his time, men were being taught to think and act for themselves, where men of wealth and position were actively engaged in fostering practical experiments, and where inducements were held out to inventors, in the form of patents, the world might not have been compelled to wait as long as it did for the perfected steam-engine.

An event occurred in this reign which had much to do with the progress of the useful arts in other countries. Many of the most industrious citizens were driven out of the country by religious persecution, and, seeking refuge in foreign lands, there introduced useful arts with which they were familiar, and laid

the foundation for subsequent manufacturing enterprises based on patents.

It is only in countries where freedom of thought and action and a spirit of independence prevail, that there can be any material progress in the useful arts, and that patents can properly perform their duty of encouraging such progress.

Returning to England, let us pass on rapidly from the time of Savery's patent (1698) to the year 1800, when Watt retired from active business life. Watt, whose name cannot be written without a feeling of profound respect and veneration, had, in 1774, sold two-thirds of the interest in his patents to Matthew Boulton, of Birmingham, and with the latter established the celebrated Soho Iron Works, where his crowning improvement, a steam-engine to drive machinery, was made in 1782.

Watt was a scholar, an eminent mathematician, and had the rare faculty of contemplating and carrying out the most gigantic schemes, and at the same time paying the closest attention to the most minute details; one year inventing and patenting the letter copying-press which is to be found to-day in all our offices, and the next year patenting the device which converted the single-acting engine of Savery and Newcomen into the double-acting engine.

Between the year 1698, when Savery patented his invention, and the year 1800, when the steam-motor of Watt had ceased to be a novelty, forty-three

patents for steam-engines, including the four patents of Watt, were granted. Of these patents, over thirty were granted after that of Watt, within a period of twenty years.

Among the patentees we shall find names which will never be forgotten. Newcomen, Brindley, the father of civil engineering; Hornblower, Bramah, the inventor of the lock which bears his name, the hydraulic press, and other inventions, covered by seventeen patents, independent of that for a steam-engine; Cartwright, the inventor of the power-loom; Murray, Murdock, the inventor of illumination by coal-gas; and many others of note.

I shall not forget our own early inventors, Oliver Evans, Fulton, Fitch, Ramsey, etc. I shall have occasion to refer to these celebrated men when I come to treat of the progress of the industrial arts in our own country.

If we want to know the history of the steam-engine prior to 1800, we must look for it among the forty-three patents. There was not a single notable improvement, prior to that time, which did not form the subject of a patent; there is no improvement up to the present date which has not been patented in some part of the world.

We cannot disconnect the history of the progress of the industrial arts and modern civilization from the history of the steam-engine; we cannot separate the history of the steam-engine from that of the patents which record the steps of improvement.

It has been at times the fashion for some of our politicians, when historical events of the old world are referred to as precedents, to declare that we are a new set of people, not to be guided by old-world ideas. This may do very well at election time; but what our future is to be depends upon the use we make of the lessons which the history of the past affords. We may be different from the rest of mankind in some particulars, we may have more freedom of action, more opportunities for exercising that freedom than the citizens of other countries; but there is one thing that cannot be changed, it must always remain the same, and that is human nature.

It is not in the nature of man to act without motives, it is not in his nature to carry out his new inventions without incentives.

We must not suppose that these early inventors of the steam-engine had an easy life of it. On the contrary, history exhibits them in the light of brave and enduring men, constantly battling against the prejudices of the ignorant on the one hand, and the covetousness of pirates on the other.

The prejudice against patents—and every patent cost a small fortune in those days—was greater than it is now, and the courts showed more or less of this prejudice, for the odious word “monopoly” stuck to the word “patent.”

Several years of the life of Watt, who had done so much for the welfare and prosperity of his country,

were embittered by litigation to which he was compelled to resort with the view of sustaining his rights.

The Cornish miners, who, of all others, received the greatest benefit from the Watt engine, made a systematic and persevering attempt to deprive the firm of Boulton & Watt of their patent and its emoluments. The battle lasted for seven years, and to the infinite credit of the courts, ended in the patent being sustained.

To jeer at an inventor's efforts in the first instance, and to steal his invention when it succeeded, appears to have been the common practice in the days of which I am writing ; and this phase of human nature, at least, has not been entirely changed in our times by our new institutions.

IV.

TEXTILE MACHINERY—EARLY INVENTORS AND
PATENTEES.

LET us now take a hasty glance at the history of textile manufactures up to the year 1800.

Most of us have seen Hogarth's series of pictures illustrative of industry and idleness. In one picture there is an apprentice, a rather nice-looking young man, who may have been industrious enough, but who has a decidedly unpleasant smirk on his face; and a pug-nosed idle apprentice who is performing the feat of going to sleep in a position which would puzzle a mountebank.

It may be bad taste, but I have very little veneration for Hogarth's pictures. This picture, however, has one merit,—it illustrates very distinctly the appliances used in Hogarth's time for the manufacture of textile fabrics.

There is a crude loom, little more perfect than the old Hindoo machine. The apprentice holds the shuttle in one hand, preparatory to throwing it along the lathe between the warp threads,—for it was the practice then to throw the shuttle first with one hand and then with the other. On the floor are a crude spinning-wheel and an equally crude reel.

It may surprise the reader to know that this primitive mode of operating a shuttle was the only mode up to 1733, when John Kay patented the "flying-shuttle," operated by a picker-stick, which doubled the weaving capacity of the loom.

The Spitalsfields operatives resisted the use of flying-shuttles. The Yorkshire clothiers adopted the invention, but, instead of paying for it, organized the "Shuttle Club," which ruined Kay by expensive law and chancery suits,—a contemptible proceeding, you will say, but not entirely unknown in our own times, in our own country.

During the short space of sixty-seven years, from 1734 to 1800, there was a wonderful revolution in textile manufactures; and the history of this revolution, which was inaugurated by the flying-shuttle of John Kay, is the history of patents for textile machinery, granted during that time. Kay was ruined, but he was an irrepressible inventor. He obtained four patents relating to textile inventions; his experimental machines for carding and spinning were destroyed by a mob, and Kay barely escaped with his life to France, where he died in poverty.

The primitive spinning-machine shown in Hogarth's picture was in common use up to 1769, when Arkwright had perfected his spinning-frame; but before this time several attempts had been made to spin more than one thread at the same time. Lewis Paul procured three patents: one in 1730, and another in 1758, for spinning; and a third, in 1748, for carding.

Paul, although his machines did not result in practical success, appears to have made considerable money by selling licenses ; for he lived in handsome style near London, where he died in 1759. We have heard of peddlers, in our own times, selling licenses for patented machines, which proved to be of little or no value.

The invention of the spinning-jenny by Hargraves (patented 1770) was a memorable event in the history of manufacturing industry ; his first rude jenny, for spinning eight threads at one time, was completed in 1767 ; a mob of spinners broke into his cottage, destroyed his machine, and compelled him to fly for his life. He went to Nottingham ; took out his patent in 1770 ; an association of manufacturers opposed him on the ground that he had sold machines before his patent was granted ; he continued to make a bare living for the remainder of his life.

Arkwright was a poor barber, occupying, in Bolton, a cellar, over which was a rude sign, announcing "a clean shave for a penny ;" but this poor barber became the enormously wealthy Sir Richard Arkwright. He made a spinning-machine at Preston, where, in abject poverty, and almost in rags, he undertook to exhibit the machine in the Town Hall, but the ominous warning of a dangerous mob compelled him to escape with his machine to Nottingham, where he had the good fortune to meet an enterprising business man, Mr. Strutt, with whom he formed a partnership ; and this enabled him to obtain his first patent, in 1769, for spinning cotton

with rollers. This was the same year in which Watt took out his first patent. More than \$100,000 were spent in perfecting the machine, which exercised an extraordinary influence in the development of textile manufactures, and laid the foundation of the inventor's enormous fortune.

As the success of Watt was due, in a great measure, to his association with Boulton, so that of Arkwright may be, in part, attributed to his partner, Strutt.

It will be well for our inventors not to forget the example, which the lives of Watt and Arkwright present,—of the advantages accruing from association with men of good business qualifications; and it will be well for legislators not to forget that even if inventors might continue to originate, without the inducement of patents, capitalists, less enthusiastic than inventors, are not likely, without some such inducement, to devote their capital and their business capacity to the development and manufacture of new inventions.

Crompton was a specimen of a very accomplished but a decidedly wrong-headed inventor. He had nearly completed his mule which was to supersede Arkwright's machine for spinning fine and even yarn, when the attack of a mob compelled him to hide his machine in a garret. He soon worked it successfully, however, and sold his yarn at high prices; but this success was the beginning of his ruin. He thought he could get along without a patent by working his machine in secret. He became suspicious of

those around him, lived an unhappy life, and finally, with a singular want of shrewdness, agreed to give manufacturers the possession of his secret on promise of payment of a sum set opposite the name of each subscriber. Several of these subscribers, it must be said, to their utter disgrace, refused to pay; and he received but about three hundred dollars for an invention by which some of these rascals netted half a million and more.

It was too late now to obtain a patent, and Crompton, in a fit of exasperation, chopped his machine to pieces, and indignantly refused several lucrative positions. Subsequently the manufacturers subscribed two thousand dollars for him; and finally the government awarded him twenty-five thousand dollars for an invention which, Sir Robert Peel officially declared, had added twenty millions of pounds to the wealth of the country.

The power-loom commenced by the Rev. Dr. Cartwright, and completed by Horrocks, soon followed the mule; but here I must stop this hasty sketch, for we have arrived at the year 1800. Up to this year, from 1733, seventy-two patents were granted for spinning, and thirty-five for weaving, while many other patents were granted which had a direct or indirect bearing on these two main branches of textile manufactures.

Dr. Wright speaking of Manchester, in 1758, says: "In the beginning of this century it was a small, mean, dirty village, now it is a large, splendid and clean town, containing fifty thousand inhabitants."

This, you will bear in mind, was before the date of Hargrave's and Arkwright's patents. In 1800, there were 12,547 houses, and 84,000 inhabitants in Manchester; and in 1871, 476,000 inhabitants.

Liverpool, in 1785, imported five bales of cotton; in 1787, 100 bales; and 100,000 in 1801, and the average yearly importation is now 2,000,000 bales. From an insignificant village in 1785, Liverpool has become one of the great cities of the world, with 500,000 inhabitants. Is there any one bold enough to deny that the patented inventions of Arkwright, Watt and others, had anything to do with this wonderful progress? Will any one deny the all-important part which the patented cotton-gin of our own inventor, Whitney, played in building up these great cities?

The reader, on perusing the above hasty sketch of the lives of a few of the most prominent inventors of textile machinery, will conclude that they were infamously treated by the manufacturers, and this was very true. Whitney experienced the same sort of treatment in our own country.

It was doubtless in this time—that is, prior to 1800—that the word “poor” became intimately connected with the word “inventor,” and it has stuck to him ever since.

To-day, in our own country, one set of men point to the inventor as *poor*, using the word in accents of pity or contempt; another set of men declare that he is a *monopolist*, and he is thus converted into the extraordinary hybrid, a “*poor monopolizing inventor*.”

A true inventor may be poor enough, but he is quite as happy, often happier, than his plodding neighbor, into whose head a new idea never crept. The man who treats an inventor with contempt because he is an inventor, or because he is poor, is to be pitied. But inventors are not always poor, there are thousands of well-to-do inventors; and we ought to rejoice in the fact, for when we see a true inventor making money, we may rest assured that the public has made a good bargain.

I am glad to record the fact that the Lancashire and Yorkshire manufacturers acquired better and more prudent feelings towards inventors, after the time treated of in the foregoing sketch. Hielmann, a most ingenious Frenchman, had expended a large fortune in experiments at Mulhausen, and, becoming impoverished, settled in Manchester, where he invented and patented the celebrated combing machine which bears his name; six Manchester firms purchased the patent for cotton for one hundred and fifty thousand dollars, and a manufacturer of Leeds paid one hundred thousand dollars for using it upon flax.

There are to-day as many prosperous inventors in Manchester and the neighborhood, in proportion to the population, as in any other place in the world; they occupy high social positions, and the sons and grandsons of the prominent inventors who have passed away take as much pride in their origin as any nobleman in the land.

V.

EARLY PATENTS FOR THE MANUFACTURE OF IRON
AND STEEL.

A GREAT inventor died in the year 1800,—Henry Cort, the father of the English iron manufactures.

In 1770 the quality of English wrought iron was so inferior that it was customary to import it from Russia ; and the manufacturers in that country, believing that the English could not carry on their manufactures without it, raised the price enormously.

All this was changed by Cort, whose patent for “preparing, welding and working various sorts of iron, and of reducing the same into uses by machinery,” was granted in 1783.

The production of iron in England, at the date of Cort’s invention, was about 90,000 tons ; in 1820, 400,000 tons ; and in 1863, 4,000,000 tons,—a wonderful development, due mainly to the invention of Cort.

Huntsman, the inventor of cast-steel, was another instance of a man trying to work his invention in secret, without the protection of a patent.

He was a very persevering man, his experiments being continued for many years before he succeeded, in 1740. The cutlers at first would not buy Huntsman’s steel, so he found a profitable market abroad, where such superior cutlery was made, that the jealous

English manufacturers tried to obtain a government order to prevent the exportation of steel,—which, to the credit of those in power, was peremptorily refused. His workmen were pledged to secrecy, strangers were carefully excluded from the works, and the whole of the steel was melted during the night, and this was continued for some time.

One cold night a wretched-looking beggar asked permission of the workmen to allow him to rest in a warm place, and they charitably complied with the request.

The beggar was an iron-founder in disguise, the secret was out, and in a few months other cast-steel works were established.

Thirty-five English patents for the manufacture of iron and steel were granted prior to the year 1800. Space will not allow me to allude even to those of importance in detail, but the wonderful history of the progress of iron manufactures, prior to that date, cannot be written without reference to these patents.

I have given a very cursory review of three leading branches of industry, up to the year 1800, and this will suffice to show the intimate relation of patents with the progress of the useful arts, and the advancement of civilization in England up to that time ; if we look into the history of any other branch of manufacture, we shall meet with the same results.

From the beginning of the reign of Charles II., (1660) up to and including the year 1800, 2,334 patents

were granted in England, but these patents did not increase at a uniform ratio during the period of one hundred and forty years ; during the first half of the time, that is up to 1730, 397, and during the second half 1937, patents were granted. Patents increased in number as the rate of progress of the useful arts and civilization increased.

VI.

EARLY PATENTS AND MANUFACTURES IN THE
UNITED STATES.

LET us now take a glance at the progress of the industrial arts in our own country.

"As early as 1660, the mother country, jealous of the increasing prosperity of her children across the Atlantic, began to hamper their trade with navigation acts, selfishly designed to compel the commerce of the Americans to pass exclusively through English hands. The House of Commons in 1719 declared *that erecting any manufactories in the Colonies, tended to lessen their dependence on Great Britain*, and laws were accordingly enacted for preventing the working of iron and steel in the Colonies."

The termination of the seven years' war, 1769, left the Colonies poor and exhausted, for their contributions in men and money had been large ; the population at this time was estimated at 2,500,000, of which 500,000 were negro slaves.

"The general characteristics of the people were intelligence, industry, and a high degree of moral and religious culture. The spirit of political freedom was strongly developed among the Colonists, and republican ideas and feelings, transmitted from the hands of the Commonwealth in England, were widely dif-

fused, but trade and manufactures were systematically restricted for the selfish benefit of England."

We all know what followed.

On July 4th, 1776, Great Britain had become to the United States a foreign country. On September 3, 1783, the independence of the United States was acknowledged by England. On March 4, 1789, was adopted the Constitution, a clause in which empowered Congress to "promote the progress of science and the useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries," and pursuant to this authority Congress in 1790 passed the "Act to promote the progress of the useful arts."

In England, from the Statute of Monopolies until very recent times, a patent has always been looked upon in the light of a special grant by the Government, a sort of privilege or indulgence, but the wise framers of our Constitution took a very different view of the subject. The history of the past had taught them that, to promote the progress of the useful arts, the inventors must be encouraged by prospective remuneration.

When monopolies were abolished there was an excellent opportunity to get clear of the word "patent" and its odious connection with the word "monopoly," and the framers of our Patent Act of 1790 had the same opportunity, but they did not avail themselves of it; they adopted the old words *patent* and *grant*,

neither of which words appear in the above-quoted clause of the Constitution.

An inventor does not ask for a gift or gratuity ; if he has made a useful invention, if it is new, he is entitled to his patent, and the Government *must* hand him the *title deed*, an act which we call *granting* a patent ; there is no gift about the transaction, the title is his by right, but like the title to any other property it is liable to be questioned.

The words *granting a patent* imply a species of Government patronage, and have induced many inventors, who are ignorant of the true spirit of our patent laws, to think that they are set apart as special pets of the Government, and a portion of the public and many politicians entertain the same notion and raise the cry of monopoly.

The Government hands the title to the inventor not as a matter of personal favor, but as a matter of just public policy.

It was not to be expected that manufactures should flourish in our country, during the closing years of the last century.

The selfish policy of England during our colonial days, the exhaustive war against the French and the still more exhaustive war of the Revolution, all contributed to prevent the establishment of permanent manufactures.

Iron had been manufactured on a small scale in Massachusetts, in 1732, but the iron used for ship-

ping, etc., was brought from England, the native iron works not being able to supply a twentieth part of the demand ; it is a noteworthy fact, however, that there were home-made edged tools and articles of husbandry at this time. Iron-works had also been established on a small scale in Maryland, Virginia, and Pennsylvania ; iron had even been exported to England in 1717, but in 1750 an act was passed preventing the erection of rolling and slitting mills in the American Colonies, and this restricted the progress of iron manufactures for many years.

The first cotton machinery made in this country, was in 1786, the Arkwright machinery was set in operation in this country in 1790, and in 1793 there was a mill in Rhode Island with 72 spindles ; cotton manufactures increased rapidly, but in 1815 and 1816, notwithstanding the home manufactures, foreign cottons to the value of one hundred and eighty million dollars were imported, and this checked the progress of American manufactures, but they were subsequently encouraged by the Tariff Acts of 1824, 1828, and 1832.

It will be unnecessary to dwell at length on the condition of our manufactures in 1800, we all know that they did not keep pace with agriculture and commerce.

In spite of this, however, we had great inventors in these early days ; among intelligent people, where freedom of thought and action prevail, and where there is any protection for inventors, ingenuity and enterprise cannot be suppressed.

In 1777, Oliver Evans, then twenty-two years of age, a country blacksmith, invented a machine for making card-teeth; a few years later he effected a revolution in the manufacture of flour by inventing and applying the elevator, conveyer, drill, and hopper-boy, but experienced the usual difficulty in bringing them into use.

There was no patent law at this time, but the very same feeling of self-assertion and self-protection which actuated Prince Rupert and the Marquis of Worcester in 1663, prompted Evans to acquire an exclusive right to his inventions; he applied to the Legislatures of Pennsylvania and Maryland and this right was granted. He also applied to the Legislature of the former State, for the exclusive right to build and run steam-carriages; not a member of the Legislature believed that Evans could succeed in his efforts in this direction, but, much to the credit of the members, they granted the right, "for the purpose of encouraging his inventive powers."

Evans was undoubtedly the inventor of the high-pressure steam-engine, which has become the universal motor in this country for land purposes, and without which there would have been no locomotive.

We cannot peruse the history of Oliver Evans, without coming to the conclusion that had he received proper encouragement, locomotives would first have run on this continent; as it was, he was the first to make a steam-carriage for common roads, which propelled itself for a mile and a half.

A few men encouraged Evans, but his efforts

were obstructed by the published opinions of so-called men of science.

These scientific obstructionists have existed from the first, we have too many of them around us to-day; they were a great nuisance in the Royal Society, and so they are to our present societies.

Evans, on December 18, 1790, obtained a patent for the manufacture of flour and meal, under the act of the same year.

He met with precisely the same persecutions which embittered the lives of the early English inventors; the men who had first laughed at his "*jim-cracks*" stole them without compunction, but Evans was not a man to be duped, he brought suit, the first ever instituted under the act of 1790, against infringers, but the Judges of the United States Circuit Court for the Pennsylvania District decided unanimously that the patent was deficient in form, insufficient, invalid, and void of itself; he filed a new application for a patent, but the Secretary of the State decided that he was not authorized to grant the patent; Evans petitioned Congress for relief, and a special act was passed January 21, 1808, authorizing the grant of a new patent, which was accordingly issued January 28, 1808, after which another series of prosecutions followed, the patent was sustained, the exasperated millers petitioned Congress, Evans filed a counter-petition, and so the fight went on. The controversy was of the most violent character. In all the disputes between inventors and manufacturers in England, none exceeded that between Evans and the American millers in pertinacity.

It was the fashion, in those days, with people who wanted to be very emphatic, to "*drop into poetry*," as Silas Wegg (one of the inventions of Dickens) says. Any idea of an alliance between poetry and inventions and machinery, or poetry and patents, would be laughed at in these days; but Dyer in his poem of the "Fleece," 1758, described the spinning-machine in admirable blank verse.

There is a very scarce little book entitled "Patent Right Oppression Exposed, by Patrick N. I. Elisha, Esq., Poët Laureate." It is, in reality, a satirical attack on the millers, the great enemies of Oliver Evans, and was evidently written by Evans himself. There is no date on the title-page, but the book, it is thought, was published in Philadelphia in 1812. It is dedicated to "the Right, the Honest Millers, throughout the United States, by the author, who is fully sensible of the impositions and frauds practised on your privileges by a crazy-pated prig, etc., etc."

We are told in the introduction to this poetical effusion that

"When man is with monopolies vexed
And by oppressors roundly taxed,"
* * * * *

"'Tis worse than smoke, a scolding wife,
Or all the other ills of life."

Alluding to the patent act of 1790, the rhymster says :

"Some years ago the moon at full,
The time it most affects the skull,
For Madam Luna at that season,
Has power to disconcert man's reason,

The Congress of these famous States,
Was amply filled with crazy pates,
Whom every knave could gull and quiz,
To do for him just what he please.
Some rogues perceiving their condition,
Forthwith presented a petition,
Right artful couched in sweetest tone,
In substance like what follows on :

"That when a man should rack his brains,
And be at some expense and pains,
To find new arts, or trades, or show,
How old ones they can better do.
No other person should or might
Have privilege, liberty, or right,
To use what he or they'd invent,
Unless he first would beg consent,
On pain of such a charge and fine.
As courts and jury might assign,
To work they went with hem and haw,
And soon patched up the patent law."

* * * * *

"Thus vile monopoly began,
To infringe upon the rights of man."

The following ending of this extraordinary effusion, although it was written sixty-six years ago, will be recognized as applicable to the recent proceedings before the Senate and House Committee on Patents, when certain agents, in the interest of Western railroads and Western farmers, denounced our patent system :

" Now let us crush this growing evil,
Planted and watered by the devil,
Unite our talents oratorical,
To Congress send a snug memorial,

Gather as thick as locusts 'round,
 To tease and pest and then confound,
 And certainly we'll be victorious,
 And save our money. Oh, how glorious!"

Evans was an inventor of extraordinary versatility, he made the first steam dredging machine, and he proposed the propelling of carriages by steam, and would have carried his suggestions into effect but for the denunciations of charlatans, who lived long enough to be ashamed of this arrogant condemnation of the propositions of one of the most ingenious men the world ever produced.

Every intelligent school-boy knows, or should know, the history of Robert Fulton, the inventor of steam navigation. Fulton's claim has formed the subject of no little discussion. The French claim the invention for a Frenchman, the English for an Englishman; it has been claimed for others, in our own country, for John Fitch, Ramsey, and Oliver Evans, although the latter, judging from the following extract from his satire, accorded the credit to Fulton :

" But patentees have seldom got,
 What they can nothing do without,
 To wit the precious cash, and then
 The terms, so short, all wealthy men
 To undertake new things afraid are.
 So we escaped this ill because
 Of that good trait in patent laws,
 Until two rascals, of New York,
 Together got to brew ill work.
 Torpedo Fulton and his crony,
 Called Livingston, who furnished money,
 And, set on by an evil spirit,
 Resolved great riches to inherit,

So had a boat made that should ply
Between New York and Albany,
To row by steam as told above,
Which, hang 'em, did successful prove."

In these utilitarian days we measure an inventor's capacity not by his suggestions, but by his success, and, measured from this stand-point, Fulton must be declared to be the father of steam navigation.

It has been urged that very little invention was required to produce a steamboat, inasmuch as paddle-boats driven by horses were well known; that steam-engines were common, and that all that Fulton did was to remove the horses and put a steam-engine in their place.

This is not the argument of a man who looks below the surface of things; it required skill, ingenuity, and, above all, daring, to combine a steam-engine with a vessel.

Fulton, like Watt and Arkwright before him, had the good fortune to obtain the advice and pecuniary assistance of a very energetic coadjutor, Robert Livingston. Fulton himself was an accomplished man, he was an artist of no mean attainments, he was the inventor of spinning and rope machinery, a submarine boat and of the torpedo, which is to play an important part in future warfare.

Fitch was another of our early inventors, but an unfortunate one.

Whitney, a graduate of Yale College, by inventing the cotton-gin, patented in 1792, did more for the interests of the cotton-growers of the South and for

manufacturers of textile materials throughout the world than any other man of his time.

But this was not his only achievement, he was the first to carry into effect at his fire-arm factory in New Haven that system of division of labor which was gradually applied to manufactures throughout the world.

It is a pleasure to record the fact that Whitney acquired a competence.

Fulton declared that Arkwright, Watt, and Whitney were the three men who did more for mankind than any of their contemporaries. He might have added a fourth—Fulton himself.

It would occupy too much space to give even a short notice of all our prominent early inventors.

From July 31, 1790, when the *first* patent was granted under the act of that year, to and including the year 1800, three hundred and fifteen patents were issued.

In the list of American patentees during that time, occur the names of all the inventors mentioned above, excepting Fulton, whose patent was not granted until 1809. There are Jacob Perkins, inventor of metal-plating, nail machines, steel engraving, the steam-guns, sectional boiler, and other devices, Charles Wilson Peale, James Ramsey, John Stevens, and many well-known inventors; on the list can also be found the name of Sir Isambert K. Brunell, the English inventor of block machinery and the builder of the Thames Tunnel.

All our early inventors, from 1790 to 1800, were patentees, and their history exhibits them in the light of thoroughly earnest men of extraordinary talent, and most persistent in the assertion of the rights acquired by their patents.

VII.

USEFUL ARTS IN FRANCE PRIOR TO 1800.

I MUST now take the reader to France.

From 1710 to 1774, when in England the useful arts were making wonderfully rapid progress and her manufactures and wealth increasing, France was in a degraded condition, her finances exhausted, her people trampled to the dust, the king and nobility revelling in debauchery and extravagance.

It seems almost impossible to-day to believe that any country, boasting of its civilization, could have been reduced to such a state of debasement as France one hundred and four years ago, when Louis XV. died.

His personal vices and his misgovernment had prepared the way for the overthrow of the monarchy, which carried with it to destruction his innocent successor.

The day of retribution was at hand. The Bastile had been taken, the palace of Versailles had been sacked, the king was virtually a prisoner at the Tuilleries; he had sworn to support the new Constitution, when, on December, 1790, the Constituent Assembly decreed that "every new idea, the manifestation or development of which can become useful to society, belongs first to him who conceived it."

The law relating to useful discoveries, and to the means of assuring the exclusive right to those who are recognized as their authors, was passed January 7, 1791; a second law, in addition to the first, was passed May 25, 1791.

The first patent granted, July 27, 1791, was to Ollivier, for pottery-ware, and was signed by Louis XVI. as King of the French.

In 1792 several patents were granted; one for driving flour-mills by steam, and in this year was patented the first of the series of improvements directed to municipal cleanliness. It is to France we owe the sanitary system, unknown a hundred years ago.

On the 17th of January, 1793, a few days before the execution of the King, a curious patent was granted, which exhibits the relentless eagerness of the people to stamp out the most insignificant traces of royalty, and the readiness with which inventors will avail themselves of every opportunity, even political agitation, to turn their inventive faculties to profitable account.

This patent was for Republican playing-cards.

The kings were replaced by the emblems of the genius of art, of war, peace, and commerce; the queens by emblems of liberty of the press, of marriage, of the professions, and of religion; knaves, by emblems of equality, of rights, of duty, and of color. The ace, which takes all, was to be an emblem of law.

This must have been rather a bad speculation, for the right which the patentee had acquired would

not compel the millions of players in France to discard the old-fashioned cards.

Changes in habit or custom do not keep pace with changes in governments and institutions, and of this all our inventors are well aware, for the most formidable of all obstacles, against which they have to contend, is prejudice based on habit, a subject which I may have to refer to hereafter.

During the Reign of Terror but two or three patents were granted. There could be no material progress of the useful arts in such a condition of society as existed during these terrible times, the account of which no one can read without a shudder.

We cannot think of these times without a feeling of sympathy for the king, who suffered for the sins of his fathers; and, certainly, every inventor should share in that sympathy, for he was a good workman, an inventor and maker of locks; an accomplished printer, whose happiest days were spent in his workshop. He was amiable, irresolute during prosperity, long-suffering in captivity, and, at the last scene of all, was every inch a man.

The year 1800 was an eventful one in the history of French industries, for in that year Jacquard, who, earlier in life, had learned the arts of weaving, book-binding, cutlery, and type-founding, and had, with thousands of his countrymen, been reduced to abject poverty during the Revolution, completed the first loom which bears his name, and for which a patent was granted in France, in 1801.

Jacquard, at first, met the same fate as the early English inventors of textile machinery ; he was mobbed by the weavers of Lyons, a city which was enriched by Jacquard as no other city was ever enriched by one man, and which tardily appreciated its benefactor by erecting a statue to the great inventor in 1840.

In 1806 the invention was purchased by imperial decree and the patent became public property.

Jacquard, who also made a netting machine, stands out as one of the greatest inventors of any country or any age ; the pre-eminence of France to-day, in the production of ornamental textile fabrics, is due to Jacquard. His invention is in universal use in all manufacturing countries—fabrics made by the Jacquard loom are everywhere.

VIII.

PATENT LAWS IN EUROPE.

THE reader will, of course, understand that the above is but a very shadowy review of the progress of three branches of the useful arts, and their relation to patents, up to the year 1800, and that I have omitted the names of many prominent inventors and patentees ; the sketch, however, will suffice to impart a comparatively clear idea of the condition of three great nations as regards industrial pursuits, when they started, seventy-seven years ago, on the race of progress, each country having a patent law to stimulate the progress of the useful arts in the future.

England had the start—she had the steam-engine in a nearly perfected condition ; iron and coal were at the doors of her manufacturers ; she had Arkwright's spinning machinery ; a large commercial fleet ; her isolated position and her trained artisans. France had been impoverished by taxation to satisfy the extravagance of her nobles, by unnecessary wars and internal strife, and her resources were to be still further drained by the wars of Napoleon. The United States had recently passed through the War of Independence ; her manufactures were in a depressed condition, if she can be said to have had any manufactures worth mentioning, but she had the high-

pressure engine of Evans, the steamboat of Fulton, and the cotton-gin of Whitney, and she had the start of the other nations in one particular—she had a liberal patent law, which was to be improved upon in after years.

In 1800 there were three great nations which had acknowledged the right of inventors to protection for limited terms.

It may be as well here to note what course countries other than the United States, England, and France, pursued, as regards the promotion of the useful arts by the granting of patents.

One of the first countries who attempted to follow our example was Russia with its patent law of 1812, a law of such arbitrary character that it can scarcely be termed a patent law. Prussia followed in 1815 with a law more exacting and less encouraging than that of Russia.

The Belgian law of 1817 was a comparatively liberal law based on that of France, and we all know that Belgium is one of the most active and enterprising manufacturing countries in the world.

The Dutch adopted a patent law in the same year. Holland stands alone as the country which has abandoned patents. The abolition occurred in 1869, the royal proclamation stating that “the grants of exclusive rights for inventions and improvements or importations of objects of art and industry promote neither industry nor public interest.”

In its experience on this subject, Holland seems to be as exceptional a country as it is in everything else.

"Such a land as Holland," says a recent American writer, "exists nowhere else. It is not merely the most singular of kingdoms, it is the only one of its kind. You may travel the world over and yet be unable to form any conception of the Netherlands. You may live there your life long, and form no adequate idea of the remainder of the globe."

It is not at all unlikely that among a people so conservative and self-satisfied as the Hollanders, patent laws did not promote industry. The people, though robust, brave, and industrious, appear to have a horror of innovation, as is attested by their obstinate adherence to sleighs in place of wheeled vehicles, for drawing heavy loads over rough pavements. Little progress in the useful arts is to be expected in a country where men and horses continue to be shod with wood, and where men, women and children are still to be found yoked to the same tow-ropes with dogs and donkeys on the banks of the interminable canals.

It may be very true that the Dutch patent law did not promote the progress of the useful arts in Holland; great progress would scarcely be expected among a people so obstinately conservative, no matter what incentives were offered; but the Dutch law was so intensely selfish in its character that it would scarcely be expected to promote any public advancement in the arts, one of its prominent clauses being to the effect that a native forfeited his patent if he secured his invention in any other country.

It will not do for those who are opposed to patents to point to Holland as a country which flourishes

without a patent law; for it is a country where the limited manufacturing interests are at a standstill, if not retrograding, and where the prominent products are gin, tulips, and cheese.

Switzerland, a country which never possessed any patent laws, is also pointed to by the advocates for the abolition of patents. In respect to Switzerland, Mr. Day, in his able paper read before the Philosophical Society of Glasgow, says :—

“ When do we hear of an important invention coming to maturity in that country? There is plenty of inventive talent in Switzerland, but Swiss inventors lack the stimulus of a patent law, and, therefore, have to come here or go elsewhere where an invention can be patented, and is recognized by the State as *bona fide* property.”

“ The patent system is the one by which a nation can secure the maximum advantage from the invention, the only one by which invention is properly encouraged, the only one by which the real value of an invention can be ascertained, and, therefore, the only one which can secure not merely reward, but a due reward, precisely its exact worth, to the inventor.”

Some of the greatest inventors of to-day are from Switzerland, but they are to be found in patent granting countries, our own amongst the number.

In Bavaria a patent law was adopted in 1826, and in Wurtemberg in 1836; in the German States of the Zollverein in 1840; Sweden, 1834; Norway, 1839; Canada, 1849; Saxony, 1850; Austria, 1852. To-day every

considerable country in Europe has its patent law, with the exception of Holland and Switzerland; and perhaps the best argument in favor of a patent system is the fact that Holland has suddenly aroused herself from her lethargy and is contemplating an enactment of a new and liberal patent law, while in Switzerland there has been much discussion about the depression of her manufactures, and especially of the watch trade, and a patent system closely allied to our own has been pointed to by some of her prominent citizens as the only remedy for the difficulty.

All the English colonies have patent laws, several South American States have adopted them, even little Liberia has its patent law, and so has that progressive country, Japan.

The effect of a patent law on the progress of the useful arts and prosperity in any nation will depend upon its justice and liberality, and on the wisdom exercised in administering it.

The English knew this in 1852, when the fees were reduced and the law was so modified that a patent should include England, Ireland, and Scotland, for which separate patents had formerly been granted.

Recently, in the German Empire, the old arbitrary law of Prussia was abolished, and a new law, of a liberal character, based partly on our own system, was adopted.

Before this law was finally adopted, however, a strong opposition to patents, with the great Chancellor Bismarck at its head, manifested itself; but discuss-

sion and inquiry led to a change of opinion which resulted in a more liberal law than that originally contemplated.

Again, in England, arbitrary enactments were recently suggested by the law officers of the Crown, but the suggestion was frowned down by public sentiment, and there is every indication in England of the adoption of wise measures based on our own system, which has been substantially adopted in Canada.

A very scanty history of the industries of the world since the year 1800 would occupy volumes; indeed, there are thousands of volumes relating to different branches, and there is not one of these which does not base the information it imparts on the records of patents. The history of the progress of the useful arts, during the last seventy-seven years, is the history of patents during that time.

I shall not attempt to give even a vague outline of the progress of the industrial arts in England and France after the year 1800, but a fair idea of that progress in England may be acquired by noticing the fact, that about fifteen hundred patents were granted in that country from 1800 to 1861 for inventions (many of them American) for preparing and spinning cotton. We all know the astounding progress which had been made in England, in this manufacture, during that time.

No matter what branch of industry we investigate, we shall always find its progress indicated by the num-

ber of patents granted at different times ; this may be accepted as an infallible guide in prosecuting our researches, and as positive proof of an intimate alliance between patents and the progress of the useful arts which cannot be severed without disastrous results in the future.

IX.

PATENTS AND MANUFACTURES IN THE UNITED
STATES AFTER 1800.

LET us turn to our own country, and look at the condition of our patent system in the year 1836.

This is set forth in the report of Senator Ruggles to the United States Senate in that year, from which report I extract the following: "When the existing organization, under the act of 1790, was adopted, the granting of patents was a matter of little importance, compared with what it now is. The arts in this country were but little understood, and but little cultivated. Agriculture and commerce constituted our principal business. We had few manufactures, except those of a domestic character, adapted to ordinary domestic wants. Our workshops were in Europe; enterprise, in this country, ran in other channels. The war of 1812 gave it a new direction, and a new impulse, by creating an occasion for workshops of our own. Necessity became the mother of invention, and American manufactures sprang into existence as by enchantment. Their rise and progress may be dated from that period; and a more rapid advancement in the arts, and a more astonishing development of human ingenuity, have never taken place in any other age or country. This remark will appear far from extra-

gant to any one who will take the trouble to examine the subject. This awakening of dormant genius to a practical and active existence, next to the arousing of the political and patriotic energies of the Union, was one of the great results of that contest. It opened to the country a new era. The nation entered upon a new existence,—she has become all at once a manufacturing, as well as an agricultural and commercial nation."

"Important and interesting as the Patent Office is now considered, it is believed, that, under such new organization as is contemplated by the bill presented herewith, it will contribute largely to the great interests of the country, and bear no small part in elevating our national character. American ingenuity has obtained much consideration on the other side of the Atlantic. Even the manufacturers of England are not a little indebted to it for some of their most valuable improvements. Her woolen manufactures, especially, have, within the past few years, undergone an entire change by the adoption of American inventions, by which wool has been made as yielding and submissive to the power of machinery as any material whatever. Cotton machinery has also been greatly improved in the hands of our mechanics, and while England receives from us three-fourths of the cotton she uses, in raw material, we furnish her also with some of the most valuable improvements in the means of manufacturing it. Indeed, what mechanism or manufacture has, for the last twenty years, been brought across the Atlantic, that has not, on being

returned, borne the distinguishing marks of the superior ingenuity of American mechanics? Formerly we borrowed and copied much that was valuable from Europe—now Europe is borrowing and copying, with no little advantage, from us, and she must not be too much surprised if she shall soon find a formidable balance against her.”

What has been the progress of our industries—a progress due to the stimulating effect of patents—since the above was written, forty-two years ago?

Volumes of carefully compiled facts, and elaborate statistical details, would be required for a complete answer to that question; a simple list of the patented inventions which have added to the wealth of the country, would fill a volume as large as that in the reader’s hand.

Schuselles’s picture of a group of twenty great American inventors, who were living when the picture was painted in 1861, tells us very little of the story of American ingenuity: it gives us the portraits of Howe, Blanchard, Bigelow, Goodyear, McCormick, Morse, Colt, Sickels, and about a dozen more of equal prominence—all great men whose names will never be forgotten; but where are the thousands of inventors, who by the intelligent exercise of their creative talents, in channels which do not command public attention, have contributed so much to the fame of our people, as the most ingenious in the world?

The following simple figures relating to exports will enable us to appreciate our inventors better than all the pictures which could be painted.

	1850.	1877.
Unmanufactured Articles	\$72,674,570	\$171,128,508
Breadstuffs	21,015,182	117,806,476
Manufactured Articles	18,299,196	149,407,180

Intelligent and observing foreigners have a higher appreciation of our inventors and of our patent system than we ourselves have, if we may judge by a comparison of the recent attacks in Congress on patents with the address of Mr. Bally to the Swiss manufacturers, on his return from the Centennial Exhibition.

A few extracts from Mr. Bally's pamphlet will serve well to illustrate the proud position we have reached under a liberal patent system.

"With zeal and with activity, the American, aided by his natural intelligence, makes his way very quickly.

"Another factor, which aids to favor the education of the people, is the excellent system of patents, by means of which, at a very moderate expense, a patent is obtained."

"Many European states have also a patent system, but as they see in it, first of all, a source of revenue for the state, those of moderate fortune can hardly obtain a patent. In Europe the inventor anxiously hides his secret from all eyes until he is in possession of his patent. The Americans do not know this uneasiness, because there the inventor alone can take a patent, which he afterwards has the right to sell if he pleases."

"Every intelligent man has thus before him the possibility of fortune, often by a very slight improve-

ment, and this keeps in ceaseless activity the intelligent part of the population."

"I am satisfied from my knowledge that no people has made, in so short a time, so many useful inventions as the American; and if to-day machinery apparently does all the work, it nevertheless, by no means, reduces the workman to a machine. He uses it as a machine, it is true, but he is always thinking about some improvement to introduce into it; and often his thoughts lead to fine inventions or useful improvements."

"To this is joined the enterprising and independent spirit of the American, the superiority of his machines, and the division of labor. Each of these would be sufficient of itself to place the American producer in a position to become a serious competitor with the European. Moreover, for a few years past we have felt this competition very sensibly."

"Swiss watch-making is so deeply affected by American competition that many makers have reduced their production, and many others have been obliged to stop entirely, because the Americans not merely make their own watches, but export also to Europe, particularly to France and to England."

"Who does not already know American sewing-machines? And who has not already become satisfied, even when machines of the same kind are made in Europe in enormous quantities, that the somewhat higher price of the American machines is largely compensated for by their construction, their solidity, and their convenience?

"Have you ever compared a rake, a spade, a knife, a hatchet, made in America, with tools made here? How much Europe is left behind! I do not speak of special articles, of which many are not even known to us."

"America furnishes already to Europe pig-iron, steel, nails, and the celebrated products in steel of Krupp have found in America rivals worthy to hold their own against them."

"At the Exposition of objects of art at Munich there was nothing in cast-iron which could be compared to the stove which I had brought home from America, not merely for the good quality of the casting, but also in the ornamentation.

"American products are handsome, solid, practical, light, and of good material."

"We must introduce the patent system. All our production is, more or less, a simple copy. The inventor has no profit to expect from his invention, no matter how useful it may be. On the contrary, each one has the right, with us, to appropriate to himself an invention, to copy it, to the great injury of the inventor. It is evident that this absolute want of protection will never awaken in a people the spirit of invention, but, on the contrary, accustoms them to copy more and more that which belongs to their neighbors, and that is not to the honor of our country. The want of protection for new inventions is a great disadvantage for us. The state ought not to hesitate to add to its resources this new resource; but at the same time, we must remember that an invention is valuable in pro-

portion to the facility with which it can be made available, and so it is essential that the grant of patents be accessible to inventors of the most moderate fortunes. America has shown us how, in a few years, a people in the midst of circumstances often embarrassing, can merit by its activity, its spirit of enterprise, and its perseverance, the respect and the admiration of the whole world, and acquire in many respects an incontestable superiority. May our sister Republic serve as our model in this!"

Whatever I have said concerning the alliance of patents with the progress of manufacturing arts, and the advancement of civilization in England and other countries, will apply with ten times the force to our own nation.

We issue more patents than any other country. We grant them at cheaper rates. We treat inventors more liberally, and the consequence of this has been that we have produced more inventors, more startling inventions, more labor-saving machinery, than any other people. The supremacy of American ingenuity is acknowledged throughout the world.

Prior to the year 1800, about 260 patents were granted in this country. At the close of 1877, 198,733 patents had been issued, and this does not include reissues, so let us say 200,000. Of this number 31,000 had expired, leaving 167,000 in force in 1877. Already, at the present writing (February 12), 430 of these have expired. Every week they are expiring, and in 1894 probably not one of these 200,000 patents

will be in existence; the public will be in full and complete possession of all the inventions represented by these patents.

To what extent has the public been taxed for the 31,000 to which it acquired a right at the close of 1877? To what extent is the public being taxed for the 198,733 patents now in force?

The answer to these questions will depend upon the meaning applied to the word "tax;" if it is understood to mean an odious exaction, an oppressive burden, and this is the meaning attached to it by some of our legislators who attack patent property, the answer must be—not one cent.

Patents have the effect of producing, at a cheap rate, things with which we are familiar and which have become necessities, and we buy these things because they are cheaper. Patents have also the effect of producing new things with which we are not familiar. People purchase these new things because they are better things, economize manufactures, save labor or add to their comfort, luxuries, or happiness; and it would be absurd to say that the cost of the things they elect to buy for their own advantage is an odious tax or imposition on the public.

The money which the inventor has earned by providing the public with new things, better things, and cheaper things,—and Heaven knows the money has been little enough,—has been well earned; and if his earnings are a tax on the public, it is the same sort of tax which the public pays for the labor of any hard-working man.

If all the extravagant and absurd stories which have been told as to the immense additions made to the manufacturing cost of patented articles, under the guise of royalties, were true, the consequent taxation, if we choose to call it so, would have been but a mite in comparison with the direct and indirect pecuniary benefit to the public—the tribute of a few drops in exchange for a perfect shower of advantages.

Forty-nine fiftieths of our great national industries are based on patents; patents invite capital, with capital, division of labor and labor-saving machinery can be adopted, and, without these, economical production is impossible.

When a machine can be made by every one there is no inducement for an outlay of capital; take away patents and we take away the capital; and the result will be inferior articles—no economy of production, no improvements.

We not only want improvements in this country, but we want to invent the improvements, and we want the right to make them; we want employment for our artisans. Abolish patents and you remove the incentive to invent; the useful arts languish for the want of capital, and we fall from our pre-eminence as a manufacturing nation.

Making all due allowances for the useless inventions which have been patented, a subject to which I shall have to refer hereafter, and for the improvements which we have derived from foreign countries, what does our country owe to the useful inventions which

are to be found among the 200,000 patents granted up to the close of last year?

No man or body of men can answer a question of this magnitude; a shadowy estimate only can be made by comparing our resources, comforts, and conveniences of to-day with those of the past; and if some of our older citizens would take the pains to do this thoroughly, none would be more surprised than themselves.

We cannot cast our eyes on any article, the advanced condition of which is not due to the inventor's art. "We cannot make a movement without touching a patented article. Asleep or awake we are surrounded by patents. They attach themselves to all our duties, studies, and recreations, they accompany us in our travels on foot, in vehicles, by railroad, or by steam-boat; they cling to us in the shape of clothing and jewelry; they enter into remedies for our diseases; and we have the cold comfort of knowing that they accompany us to the grave in the shape of patented coffins. We cannot get clear of them."

We owe our present civilization to our free institutions, the enterprise of our people, education and patents.

The legislator may smile when he reads this last item; but the lower he looks below the surface of things, the more carefully he considers the past history of patents, the more intimate will become in his mind the alliance between patents and civilization.

Partners in any undertaking get along amicably together while things go well; but when a reverse

takes place, a disposition of one partner to blame the other and make unreasonable complaints exhibits itself.

It is the same with nations.

There are three great sections in partnership in this country—the West, the South, and the East. Hard times are upon us, all the sections suffer, more or less fault-finding is rampant, and is directed mainly against the East, which, by an extraordinary hallucination, is supposed to be the most prosperous at a time when failures are reported every day, when a large number of our workshops are closed, and thousands of our artisans are reduced to beggary. As our large manufacturers are mainly in the East, and as their establishments are based on patents, the latter have been a special subject of attack.

The Hindoos, when scourged with the cholera, attribute the latter to the comet; trade and manufacturing interests are dull, and some of our people blame patents for it.

We have land enough in the West to feed the world, we have the precious metals in the far West, we have the cotton and sugar in the South, we have the manufacturing enterprise of the East, we have the coal and iron, we have commercial outlets on the seaboard, our canals, navigable rivers, railways, and the telegraph, have brought all sections closely together, we have everything to make us the greatest agricultural, commercial, and manufacturing nation of the world, and that must be our destiny if partnership quarrels and class legislature do not militate against it.

The opening of the West has been quite as

much due to the inventor's talent as to the enterprise of our people. "Agriculture might as well dispense with the fertility of the soil as with the aid of the genius of invention in its cultivation." Future ingenuity may be devoted to enhancing the prosperity of the South, which is teeming with unutilized products waiting for the inventors' skill, and where there is an intelligent people to appreciate his efforts.

Invention, aided by science, "has lengthened life; it has mitigated pain, it has extinguished diseases, it has increased the fertility of the soil, it has given new securities to the mariner, it has furnished new arms to the warrior, it has spanned great rivers and estuaries with bridges of form unknown to our fathers, it has guided the thunderbolt innocuously from heaven to earth, it has lighted up the night with the splendor of the day, it has extended the range of the human vision, it has multiplied the power of the human muscles, it has accelerated motion, it has annihilated distance, it has facilitated intercourse, correspondence, all friendly offices, all dispatch of business; it has enabled man to descend to the depths of the sea, to soar into the air, to penetrate securely into the noxious recesses of the earth, to traverse the land in cars which whirl along without horses, to cross the ocean in ships which run ten knots an hour against the wind. These are but a part of its fruits, and of its first fruits, for it is a philosophy which never rests, which is never perfect. Its law is progress. A point which yesterday was invisible is its goal to-day and will be its starting point to-morrow."—*Macaulay.*

X.

ABOUT INVENTORS AND THEIR TRIALS.

THE reader must not suppose that in the writer's opinion all inventors are saints, all patentees are inventors, or that the patent laws and the administration of these laws are all that they should be.

Inventors belong to the great family of originators, and must be classed with authors, artists, and all whose work is the result of intellectual labor, exercised "in devising something new or not known before, or in modifying and combining things before made or known, so as to form a new whole."

The inventors of new machinery or new processes, who think that they are set apart from the rest of mankind, as a special race, and such opinions are not uncommon, make a great mistake ; the creative faculties are displayed in the ingenious arguments of the lawyer, the rhetoric of the orator, the diplomacy of the statesman, the operations of the surgeon, the tactics of the general ; all are inventors in one sense of the word, although by common consent and usage the word "invention" to-day applies more especially to the creation of new devices, processes, or products, due to the direction of the human intellect in special channels to utilitarian purposes.

Another great mistake is sometimes made by inventors in supposing that a verbal hint, a hasty suggestion, or an incomplete sketch of a passing idea, is invention,—it is merely the shadow, and the public demand the substance; there must be reduction to practice, useful results, or there can be no invention.

The rough, sketchy outline made by the artist may foreshadow the picture, but it is not what the public demands; he is no artist until the picture is ready for enjoyment by the public; the headings of the chapters of a novel may satisfy the author as to what the contents of the book are to be, but the public must have the book itself before the title of author can be conferred on the originator.

Practical results of well-directed exercise of the intellect, results which can be enjoyed by the public, are what the law looks upon as invention.

On the other hand, the inventor may carry his conceptions into effect by the aid of skilled labor without losing his title to the invention, carried into effect by that skill. No reasonable man attempts to detract from the merits of Rubens as an artist, because his pupils filled in part of his pictures with skillful hands. No one doubts the originality of the novels of Dumas, because he employed men of literary skill to put words in the mouths of the characters whom the author had created.

It is the active, industrious inventor, not the visionary schemer, whom the law favors, under our patent system, the man who carries his ideas into effect and makes them available to the public.

There are circumstances, however, under which the law will take cognizance of the rough sketch and even verbal suggestions of an inventor, and that is when he is exercising reasonable industry in putting them into practice, and when there is a rival claimant, then the law will recognize the suggestions as evidence, not so much of the invention, as of the conception which the originator is exercising proper efforts to reduce to the character of an invention.

There is one respect in which the inventor has the advantage of his brother originators, the author or the artist : he can, in the majority of cases, reduce his ideas to shape much more readily than the author can finish his book or the painter can complete his picture ; the inventor can make, or have made, a drawing of his machine, and no matter how complex the latter may be, the drawing, if properly made, will be to the expert mechanic quite as intelligent as the machine itself.

The true inventor, however, is subjected to many trials : first, his efforts are derided, and this has always been the case—the Marquis of Worcester was hooted at as a madman ; Oliver Evans was denounced as a crazy-pated schemer, and it is the same to-day in a less degree. When the inventor's efforts approach success, there is the usual fault-finding, belittling, and denials of originality by plodders, who never had an original idea in their heads. Many of us have witnessed the beautiful play of the Colleen Bawn. The fault-finding critics first sneered at it, but the intelligent people went

to see it ; when success was assured, the criticising plodders got angry and declared that Boucicault stole the play from Griffin's novel of the "Collegians," in which I never could find any material traces of the play. The same sort of critics, no doubt, lived in Shakespeare's time, and found fault with him because he did not invent the original of the character of Julius Cæsar.

"The art of printing," said Judge Grier, "was stumbled over for four thousand years ; and if a patent for it were now presented to our expert, he would show you at once that the whole art consisted in multiplying impressions from a combination of movable types. He would point you to the tracks of animals as original impressions from movable types, and show the invention of printing letters to be as old as Adam."

"Few patents would stand the test of such ingenuity as this. Incredible as it may appear, yet it is nevertheless true, that on the trial of the originality of the Morse telegraph, it was gravely argued that two-thieves in the penitentiary, who had corresponded by means of scratches and dots, on the prison wall, had preceded Morse in the invention of this most astonishing and useful art."

The man who undertakes to invent against habit and custom may expect to have a hard time of it. There are thousands of useful inventions which have remained dormant for years, often during the life of the patents and frequently during the lifetime of the inventor, owing to the obstacles which habit presents to their introduction.

The force, or rather tyranny, of habit, may be best explained by reference to familiar things of every-day use. If the reader wears a frock or swallow-tailed coat, and will put his hands behind his back, he will find two buttons at the junction of the tails with the body of the coat, and, perhaps, two buttons at the ends of the tails. The buttons on the dress of a Chinese mandarin mean something, they indicate the rank of the wearer, but we have no earthly use for the rear buttons on our coats : our ancestors had, however, for before the time of fast coaches, when they traveled on horseback, the buttons then served as mediums for looping up the tails of the coat so that they should not interfere with the rider's comfort. The buttons stick to us yet.

About thirty-five years ago, a London tailor had the audacity to make a coat without these buttons in the rear ; it was termed a Taglioni, the original of our modern sack-coat. The first men who had the courage to wear these novel garments were hooted at as though they were criminals, and by men, too, who wore stove-pipe hats—the most preposterous head coverings ever invented.

Put your hand at the back of your neck and you will find a folded collar, cravat, and shirt-band, three thicknesses of fabric ; a folded collar and lining on the vest, three layers ; and then three more on the coat, nine layers in all, while on the other parts of the body we are satisfied with two or three layers, and while the young lady near us is content with a light ribbon or necklace. Why do we commit such

absurdities ? Because the royal fop, George IV., or his crony, Beau Brummel, invented rolling collars.

Hunt, one of our prominent inventors, died in the midst of his unsuccessful efforts to introduce his patented paper collars, which were at first universally ridiculed. An enterprising man undertook their manufacture, pushed them by main force on the market, and now the manufacture of paper collars, for which there are at least fifty patents, is one of our most prominent industries, as extensive almost as that of wooden-ware ; but they would never have found favor with the public if the manufacturer had not submitted to the tyranny of habit by making the surface of the paper in imitation of linen, and indenting the paper to imitate stitches.

As soon as an inventor succeeds he is met by the attacks of pirates ; the very men who deride his efforts are the very first to appropriate his invention, just as manufacturers did with the first inventions of spinning machinery, and as the millers did with the devices of Oliver Evans.

Originator's other than inventors are not free from this evil—literary piracy prevails to-day to an enormous extent ; there were three thieves and one author who laid claim to the little poem of " Beautiful Snow," and it is quite common for born plodders, without an original idea in their heads, to manufacture books with scissors and paste, and claim to be full-fledged authors ; but the inventor has many more difficulties to surmount in establishing his right to the result of his intellectual labor than any other originator.

After completing his invention he must seek a solicitor to prepare the proper papers for an application for a patent, and prosecute the latter before the Patent Office, and secure the patent, which is the title deed of his intellectual property.

The future welfare of the inventor depends upon the manner in which these duties are performed, and yet, as I shall show hereafter, there are no professional duties, which are more frequently performed clumsily and recklessly than these, in every part of the country.

The inventor has obtained his patent, he feels secure, and he pursues the manufacture with pecuniary success; and now come the gadflys buzzing about the successful inventor, the copyists and adapters, who cannot exactly be classed with pirates, for they are actuated quite as much by a spirit of imitation as by avarice. This spirit prevails everywhere, and exhibits itself in all trades and professions, and in all phases of society.

A few weeks after the national banks were established, the sign-painters were at work all over this city, and there was an eruption of first national barber shops, segar stores, eating-houses, oyster stands, etc.

A manufacturer made a popular stove and named it the "Sunnyside;" both the stove and the name became popular, and the sign-painters went to work again, and in a short time we had Sunnyside taverns, Sunnyside ice-cream saloons, Sunnyside corsets, Sunnyside shirts, etc. Then came the word Centennial, which threw all others into the shade. There was a general scramble for the word: it was applied to every imagi-

nable thing; suit was brought against the Exhibition managers for the use of the word on medals, there was another suit about Centennial shirts,—but all this is over; we have had enough of the Centennial, and the word has been abandoned everywhere. It has been dull times with the sign-painters recently; but I observed symptoms of another eruption, the other day, in the shape of a big silver dollar painted over a store.

Adapters and improvers, however, are not to be despised; their additions to or simplifications of the originator's invention are frequently of great importance, and tend to increase the value of the original invention; indeed, it is by a succession of improvements that perfection in machinery, apparatus, and process is approached.

The pirates and adapters go to work, change some parts of the successful inventor's machine, add others, look for the weak points in the patent, and try to get a patent of their own, with more or less success, and suddenly the original patentee awakes to the fact that the patent is not the instrument he supposed it to be. He has not been told where the weak points of his patent are, or how much the patent covers. This is one of the worst evils resulting from the present practice of soliciting patents, of which I propose to take special notice further on.

But if the patent is a good one, and fairly covers the ground, there is another danger. His rival may go to the Patent Office, hunt up the records, and discover and buy up some old, obsolete patent for an

invention, some features of which have a resemblance to parts of our inventor's patent. The old patent is re-vamped by re-issue, and the inventor finds that his own patent property is subordinate to this old, patched-up affair. Suits follow, and not unfrequently the inventor is ruined.

In spite of all these difficulties there are thousands of well-to-do and prosperous inventors, but these are the men who have learned by experience, sometimes by a very bitter experience, how to surmount the difficulties. On every hand are to be found inventors who have made fortunes, and there are many more who have made moderate sums; but in all such cases it will be found that hard work and perseverance have had as much to do with these successful results as ingenuity. It is the new inventors who are victimized and often succumb to the formidable difficulties which present themselves, and become ruined and disheartened. To such an extent has this prevailed, that patents are looked upon with more or less suspicion throughout the length and breadth of the land.

Our law-makers, instead of favoring bills, which, if passed, must succeed in crippling the efforts of inventors, and proposing amendments which, if they become law, must arrest progress of the industrial arts, should direct their attention to the evils as they exist and where they exist, and not ruin a system which, in spite of all its defects, has made us the most ingenious nation in the world. It is possible that I may be able to point out in the next chapter some of the weak points which our legislators can attack with the best results.

XI.

THE UNITED STATES PATENT OFFICE—ITS EARLY HISTORY.

WE have seen that the first act of Congress on the subject of patents was passed in 1790. It authorized the Secretary of State, the Secretary of War, and Attorney-General, or any two of them, on application, to grant patents for such new inventions and discoveries as they should deem "*sufficiently* useful and important."

Under this act the Board exercised the power of refusing patents for want of novelty, or of sufficient utility or importance.

In 1793 the act of 1790 was repealed and another act passed, authorizing patents to citizens of the United States only, to be granted by the Secretary of State, subject to the revision of the Attorney-General.

In 1800 the privilege of taking out patents was extended to aliens who had resided two years in this country, and made oath of their intentions to become citizens.

The act of 1793 gave, according to the practical construction it received, no power to the Secretary to refuse a patent for want of either novelty or usefulness. The only inquiry was whether the terms and

forms had been complied with; the grant of patents was therefore simply a ministerial duty.

I have before me the report of a select committee of the Senate appointed "to take into consideration the state and condition of the Patent Office and the laws relating to the issuing of patents for new and useful inventions and discoveries." This report, which was presented April 28, 1836, by Mr. Ruggles, with Senate bill No. 239, is especially valuable, as it gives us a clear idea of the opinion of wise legislators as regards the evils resulting from the indiscriminate issue of patents without question as to novelty. I therefore introduce the following quotations:

"Under the act referred to (the act of 1793) the Department of State has been going on for more than forty years issuing patents on every application without any examination into the novelty of the invention, and the evils which necessarily result from the law as it now exists must continue to increase and multiply daily till Congress shall put a stop to them.

"Some of these evils are as follows:

"1. A considerable portion of all the patents granted are worthless and void, as conflicting with and infringing upon one another, or upon public rights not subject to patent privileges, arising either from a want of due attention to the specification of claim, or from the ignorance of the patentees, of the arts and manufactures, and of the inventions made in other countries and even in our own.

"2. The country becomes flooded with patent monopolies, embarrassing to *bona fide* patentees

whose rights are thus invaded on all sides, and not less embarrassing to the community generally, in the use of even the most common machinery and long-known improvements in the arts and common manufactures of the country.

"3. Out of this interference and collision of patents and privileges a great number of lawsuits arise, which are daily increasing in an alarming degree, onerous to the courts, ruinous to the parties, and injurious to society.

"4. It opens the door to frauds, which have already become extensive and serious. It is represented to the committee that it is not uncommon for persons to copy patented machines in the model room, and having made some slight, immaterial alterations they apply in the next room for patents.

"There being no power given to refuse them, patents are issued, of course. Thus prepared, they go forth on a retailing expedition, selling out their patent rights for States, counties, and townships to those who have no means at hand of detecting the imposition and who find, when it is too late, that they have purchased what the vendors had no right to sell, and what they obtained thereby no right to use. This speculation in patent rights has become a regular business and several hundred thousand dollars, it is estimated, are paid annually for void patents, many of which are thus fraudulently obtained."

The report from which the above is a quotation, resulted in the patent act of 1836, which established the Patent Office as a bureau, with a Commissioner at its head, under the direction of the Secretary of State.

XII.

THE EXAMINING SYSTEM—ITS PAST AND PRESENT
CONDITION.

THE act of 1836 commanded the Commissioner "to make, or cause to be made, an examination of every alleged new invention or discovery, and if, on any such examination, it shall not appear to the Commissioner that the same had been invented or discovered by any other person in this country prior to the alleged invention or discovery thereof by the applicant, or that it had been patented or described in any printed publication in this or any foreign country, or had been in public use or on sale, with the applicant's consent or allowance prior to the application, if the Commissioner shall deem it to be sufficiently useful and important it shall be his duty to issue a patent therefor."

If the application should be rejected for want of novelty the Commissioner was commanded to "notify the applicant, giving him briefly such information and references as may be useful in judging of the propriety of renewing his application or of altering his specification, so as to embrace only that part of the invention or discovery which is new." There was also to be a right of appeal to a Board of Examiners from the adverse decisions.

This was the beginning of our present examining system.

An inventor goes to the proper officer of the Government, and says I have an invention here for which, on the ground of its novelty and utility, I demand a title deed, giving me the sole right, for a certain time, of making, using, and selling the invention. Prior to the act of 1836 the authorities did not inquire into the correctness of the applicant's assertions, but gave him his title deed without a question as to novelty or utility; after the act, however, the Government officer, in reply to the applicant, said we cannot accept your simple assertion; you may think you have made an invention, but it is probable enough that you are mistaken; the public and prior patentees have something to say about the subject, and, as the servant of the public, I must see whether your invention is really an invention, whether it is already the property of the public or not, or the subject of a prior patent, or whether you have claimed more than you are entitled to; we cannot give you a title to what is already public property, or to what some one else has already acquired a title to; we will examine the records, and if we find you are entitled to a patent for what you demand you shall have it.

Can any one doubt the wisdom and sound public policy of this mediation of the Government between the claimant for a patent, and the people?

The act of 1836 and the immediate appointment of Examiners in accordance with that act had the wonderfully wholesome effect set forth in the report

of the late Mr. Fitzgerald, one of the Examiners in 1850, fourteen years after the passage of the act, from which report I extract the following:

"No one feared to infringe a patent (granted under the old system without examination), as he was sure to be able to defeat it for insufficiency of description, a defective claim, or for covering what would be shown to be old. The maxim was that any patentee would be defeated who dared to commence a suit, and the most valuable invention seldom afforded any remuneration to the inventor. Patents were not only defective, but their reputation was bad. This old system, so utterly defective, and so little calculated to accomplish the object for which it was intended, which placed the fortunate or ignorant pretender on a footing with the meritorious inventor, was finally abandoned and condemned in 1836, and the present system, subjecting all applications to a rigid examination, and basing all patents upon novelty and utility only, and refusing them for all spurious and pretended inventions, was adopted and carried into effect. Under this system, examinations immediately developed the fact, that nearly half the alleged inventions upon which patents were claimed, were mere repetitions of what was already known, and nearly all the papers filed upon which patents were to be based, were partially defective and required amendment before letters patent could be granted. Thus was marked an important era in our patent interests. The standard was by degrees elevated. It was found that the infringement of a patent which had been pre-

viously perpetrated without fear and with impunity, had become a dangerous experiment. Patent property began to be viewed in a different light, and after a few years of experience in the practical effects of the new patent system, almost universal confidence was inspired among those who had previously abstained from procuring patents."

"At this juncture applications for patents began to increase rapidly. Prior to 1844 for several years the number of applications had averaged about eight hundred; but in 1844, they began steadily and rapidly to increase, until in the short space of seven years they have almost tripled; the number filed in 1850 being about twenty-two hundred; while for fifty years under the old system, and the incipiency of the new, they had only reached about eight hundred. As time passes, this increase becomes more rapid. It appears, therefore, that this system of examination, although it results in the rejection of half the applications for want of novelty, gives such security for real inventions as to foster and encourage the intelligent seeker after hidden truth, more than any system heretofore adopted in this or any other country."

The beneficial results of our examining system must always be proportionate to the wisdom exercised in carrying it into effect, and it must be admitted that there has always been much discussion as to the best mode of doing this.

Our early Examiners were strict and exacting, frequently to an extent which rendered their judgments illiberal and even unjust.

Searches amidst the records of the Patent Office frequently bring to light inventions of great value, described in rejected applications, which have been abandoned in despair, owing to the arbitrary acts of our early Examiners who undertook to decide *ex cathedra* not only questions of novelty but questions of practical utility and even of the commercial value of inventions. Instances are not uncommon in which inventions declared to be frivolous by early Examiners subsequently effected revolutions in particular branches of industry, and became the foundation of gigantic manufactures.

Different constructions were put by different Examiners on the word "*utility*," and the words "*sufficient value and importance*," in the statute; one man contended, that in view of these words, it was his duty to form an opinion as to the practical and commercial value of an invention and to pass upon its inferiority or superiority to prior inventions in the same branch of the useful arts. Another denied that the statute vested such absolute authority in the Commissioner or Examiners.

No man is endowed with that sagacity, or spirit of prophecy, which will enable him to appreciate at once, in every instance, the utility of an invention, or to foretell its future value and importance to the public.

There is a conservative element in human nature, born of habit and prejudice, which militates against innovation, and it is this spirit which all of our greatest inventors have had to fight against, from early

times down to our own, although it is true that the world, as it has grown older, has become more tolerant of inventors and their projects ; if it had not, the present advanced condition of the useful arts would never have been reached. This force of habit, however, this doubt about novelties and love for old things, still remain for our inventors to struggle against.

Two-thirds interest in the original Howe sewing-machine was offered to a neighbor of the writer for the cost of taking out a patent ; but although this offer was made to a gentleman who was himself an inventor, and an enterprising and successful manufacturer, it was refused.

To permit any man to exercise the right of deciding the question of patentability on the strength of his own preconceptions as to the practical or commercial value of inventions, or their superiority or inferiority to other inventions, is subversive of all ideas of free institutions. But some of our earlier Examiners continued to exercise this power even after the courts had declared the word "useful" to mean simply "capable of being used," in contradistinction to absolute frivolity, and had distinctly held that it is not necessary to patentability, that an invention should be superior to prior devices of the same class. All the Examiners did not keep pace with the courts as regards liberality in the estimate of inventions; indeed to this day there are occasional instances of the assumption by an Examiner of authority which is not countenanced either by the rulings of the courts or the general practice of the Office, or by common sense.

Judge Mason's appointment to the Commissionership, in 1853, was an important event in the history of the examining system.

It had been the custom to appeal directly from the adverse decision of an Examiner to one of the judges of the District Court of Columbia, the Commissioner rarely undertaking to reverse the action of his subordinates; but Judge Mason permitted applicants, whose cases had been rejected, to appeal directly to himself. His actions in these appeal cases were characterized by good judgment and liberality, and this inspired something of the same spirit in his subordinates; this appeal duty, however, became so onerous that three Examiners were detailed to attend to it, and this was the origin of the Board of Examiners-in-Chief established under the act of 1861.

As the number of Examiners increased, the greater was the want of uniformity in their practice; and this formed a special subject of complaint in Commissioner Mason's report for 1855.

The number of applications for patents increased. In 1850, the number filed was two thousand one hundred and ninety-three; in 1855, four thousand four hundred and thirty-five; in 1860, seven thousand six hundred and fifty-three; in 1861 there was a sudden falling off, owing, no doubt, to the war; in 1865, the number had increased to ten thousand six hundred and sixty-four, and in 1870, to nineteen thousand one hundred and seventy-one; in 1877, twenty thousand three hundred and eight. After Judge Mason's retirement, in 1857, the Patent Office was well conducted

by other Commissioners of ability ; but for three or four years prior to May, 1869, the affairs of the Office were in a very confused and discreditable state.

The late Mr. Fisher became Commissioner in 1869. He was not only a lawyer of great learning and ability, but had an extended technical knowledge, and the highest order of administrative abilities, the influence of which was soon felt in the Patent Office. He insisted upon his rulings being obeyed by his subordinates. He published his decisions, and within a year there was really more uniformity of practice among the Examiners than was ever known before ; at the same time, he inculcated the exercise of reasonable liberality in the examination of applications.

Gen. Leggett, another able Commissioner, succeeded Mr. Fisher ; he established the *Official Gazette*, a weekly publication, giving the list of patents granted during the week, the decisions of the Office and the courts, and promulgating whatever new rules were adopted ; he also commenced the printing of patents, reproducing the drawings by the cheap process of photo-lithography.

This was a most important step, as copies of any patent granted within a given time can now be obtained at a very cheap rate ;—no greater boon than this could have been conferred on inventors and the public.

Mr. Thacher, another experienced officer, succeeded Gen. Leggett.

The present Commissioner is Gen. Spear, who, as a subordinate in different positions in the Patent Office, had more experience of the inner working of that bureau than any Commissioner before him.

Of late years a system of compilation has been adopted in the Patent Office, that is the collecting together in the rooms of each Examiner of drawings and other particulars of the classes of inventions to which that room is devoted. If these compilations proceed at the present rate, if the reprinting of the old patents is continued, the room of every Examiner will, in the course of a year, be provided with such a complete history of the useful arts, to which his classes relate, and these will be so arranged in sub-classes, that examinations can be conducted faithfully and in a remarkably short time.

Indeed, at the present time, although between two hundred and three hundred patents are granted weekly, more satisfactory examinations are made than ever before, and generally in less time than was ever before known.

There is, I think, a larger average of good Examiners than at any time in the history of the Patent Office, and their duties are as well, or perhaps better performed, than at any other time, and with greater uniformity, for the publication of decisions since 1869 has contributed much to the bringing about an uniformity of practice among Examiners.

For all this, complaints against the Patent Office, and against the administration of that office, are heard everywhere, and that there is something radically

wrong in that bureau has become firmly fixed in the minds of a large portion of the public.

The fact is, the Patent Office cannot reply to the repeated charges that are made; a disappointed inventor inveighs against an officer of the Patent Office, and publicly declares that he has been unjustly treated, whereas his disappointment may be due to his own actions, or to the short-comings of his attorney: an attorney fails in his attempt to secure a patent, and excuses himself to his client by attacking the Examiner: an applicant may want something he ought not to have, and have an attorney willing to press such a claim; if they fail, of course both are angry: a patentee becomes exasperated because some one has obtained a patent apparently closely allied to his own, and vents his wrath on the Patent Office, where an inquiry into the scope of his rival's patent may show that the similarity is rather apparent than real.

This, bear in mind, has been going on for years, and all the time the authorities must remain silent, so it is no wonder that the public impression of the Patent Office is not an entirely favorable one.

One of the most prominent complaints is that too many patents are granted, that many patents are issued for frivolous inventions which are really not inventions.

Of course many frivolous patents go out of the Office, and there are many more not as frivolous as they appear. Mistakes are made occasionally, some-

times absurd mistakes. More than one patent is sometimes, but very rarely, granted for the same thing, and many patents go out which should not be granted.

It must be admitted, too, that there are many patents granted for adaptations, which are not inventions ; it must also be admitted that there exists a set of men, who may be termed professional schemers, and who are a curse not only to real inventors, but to the community and to the Patent Office, and especially to manufacturers ; they are what birds of prey are among the feathered tribe.

These men hover about inventors, and, incapable themselves of originating, pick up ideas and steal them ; or, what is almost as bad, engraft on them some crude notions of their own, and claiming an inventor's rights, get patents, not for the purpose of carrying their so-called inventions into effect, but with the hope of some day levying tribute on a legitimate inventor, or upon some manufacturer willing to purchase peace. In fact these professional schemers get out patents to trade with, and of course they are nuisances,—their acts tending to obstruct rather than to promote the progress of the useful arts.

On the other hand, it is rarely that an invention is perfected by the originator. We have seen how slowly the steam engine advanced towards perfection, —if it *is* perfected, which may well be doubted,—and how many different minds were brought to bear on it before Watt added what he considered, and what the world then considered, the finishing stroke. To

discourage improvement by illiberal action in the Patent Office, would be far more obstructive to the progress of the useful arts than all the mischief professional schemers and pirates can do.

It may be said that the Office ought to distinguish between what is a real improvement and what is an imposition, but if this is to be done we must give the officers of the Patent Office an intolerably arbitrary authority ; what may appear to an Examiner a frivolous thing,—no advancement in the art to which it relates,—may be an improvement of vast import. An Examiner is not always capable of judging of the effect of an improvement ; his judgment may be entirely astray and great injustice might follow his adverse action.

It will never do to go back to the old times when Examiners exercised the authority I have stated above.

There has been much discussion about the examining system, and its total abolition has been seriously advocated, but the immediate effect of this would be to throw the work of examination into the hands of solicitors.

Whoever performs the work is really an arbiter between inventors themselves and between inventors and the public at large, and to take this work of arbitration from the hands of public officers, directly responsible to the Government, which may assure their fitness and competency, and place it in the

hands of private parties whose responsibility or competency is unascertained, would be a most unwise proceeding, whether as regards the interests of the public at large or of inventors.

The charges made against the examining system really bespeak only defects which can be remedied ; the system itself is believed to be sound in theory and beneficial in practice for the following reasons :

1. Because such examination is necessary to give patents even a *prima facie* presumption of validity.
2. Because it is the most effectual check possible upon the creation of false titles, or conflicting titles.
3. Because it leads to greater care and precision in the preparation of specifications and claims.
4. Because it tends to increase the availability and value of patents as negotiable property.
5. Because it relieves inventors of a duty which otherwise they would have to undertake for themselves ; and which they could perform, if at all, only at much greater expense of time and money, and not nearly so well.
6. Because the system necessarily brings about a vast and well arranged and accessible collection of information touching the practical arts, and to this purpose appropriately devotes a large proportion of fees paid by inventors.

XIII.

PRESENT MISCHIEFS ATTENDING PATENTS AND
REMEDIES THEREFOR.

WHAT is the cause of the prevailing want of faith in patents and the Patent Office?

We must find an answer to this question before a remedy can be suggested, and the main answer must be—*the ignorance which prevails among a very large majority of our people, as to the true character of patent property, and the true nature of the patent system.*

It will not do to turn round and say, in reply to this; “We cannot legislate brains into the heads of the ignorant,” the Government has an intelligent people to deal with, and this ignorance concerning patent matters is not confined to the most illiterate, and those of the lowest order of intellect, it prevails among men whose business transactions are characterized by sagacity and discretion, and among educated men, too, who have not made themselves familiar with the subject; and one of the causes of this ignorance is to be found in every patent issued, upon the title-page, of which the following is a copy:

TO ALL WHOM THESE PRESENTS SHALL COME.

Whereas, John Y. Smith, of Philadelphia, Pennsylvania, has presented to the Commissioner of Patents, a petition, praying for

the grant of Letters Patent, for an alleged new, and useful Improvement in Steam Engines, a description of which invention is contained in the specification, of which a copy is hereunto annexed, and made a part hereof, and has complied with the various requirements of Law, in such cases made and provided, and

Whereas, upon due examination made, the said Claimant is adjudged to be justly entitled to a Patent under the Law.

Now, therefore, these Letters Patent are to grant unto the said John Y. Smith, his heirs, or assigns, for the term of seventeen years, from the day of 187 the exclusive right to make, use, and vend the said invention, throughout the United States and the Territories thereof.

In testimony whereof, I have hereunto set my hand, and caused the seal of the Patent Office to be affixed, at the City of Washington, this day of in the year of our Lord 187 and of the Independence of the United States of America the one hundred

{
SEAL.
}

Countersigned,

Secretary of the Interior.

Commissioner of Patents.

This title-page is a very formidable-looking document: there is the seal, the ribbon, the signatures of the Commissioner of Patents and the Secretary of the Interior; there is the announcement of the grant of an exclusive right, nothing to signify that this right may be questioned; there is nothing to notify the grantee, that in view of prior patents, he cannot use all that is shown in his drawing and described in his specifications.

It is an illusory and dangerous title, illusory because it does not set forth the true character of the property to which it relates, and dangerous because

it has a formidable appearance, tending to create misplaced confidence.

Many a cautious man who would never think of purchasing ordinary property without close scrutiny, and asking the opinion of others, has bought a patent or an interest in a patent without question, on the strength of a formidable title-page.

The French law-makers appear to have provided against any false impression which the public through ignorance might acquire as to the true character of a patent, by printing on the title-page of every patent deed the words, "Not guaranteed by the Government," yet the title-pages of our patents do not contain a word of caution.

It occurs to the writer that a title something like the following, would be more consonant with the true state of the law and the facts, and altogether preferable.

TO ALL TO WHOM THESE PRESENTS SHALL COME :

Whereas, John Y. Smith, of Philadelphia, Pennsylvania, has deposited in the Patent Office a specification (of which a true copy is hereunto annexed) describing an alleged Improvement in Steam-Engines, of which Improvements, as defined by the claim at the end of said specification, he claims to be the original and first Inventor, and has deposed upon oath, that to the best of his knowledge and belief the said Improvements were not known or used in this country before his invention thereof, and that the same have not been in public use or on sale with his consent and allowance for more than two years before his application for these Letters Patent.

And whereas, it appears on due examination that the said specification and claims are sufficient in law, and that no prior description of the said Improvements is found in any Letters Patent or printed publication in the records of this office.

Now, therefore, these Letters Patent are to certify that upon the said evidence before the Patent Office at this date, it appears that the said John Y. Smith, his heirs or assigns, are entitled under the law to the exclusive right of making, using, and vending the said Improvements, as claimed by him, for the term of seventeen years from this date, within the whole United States and Territories thereof.

In testimony whereof, etc., etc.,-----



Secretary of Interior.

Commissioner of Patents.

NOTE.—The Government does not guarantee the novelty or utility of the invention herein set forth, nor the validity of these Letters Patent.

This suggestion I simply give for what it is worth, and under the belief that if carried out it would tend to give the public and inventors an insight into the true character of patent property, by notifying every patentee that the novelty of his invention is not guaranteed; that the title may be questioned at any time; that the protection is directed to no other part of the thing shown and described than that defined by the inventor himself in his claims; that the deed is simply *prima facie* evidence of his right to the thing or parts claimed; and that the examination was a simple precautionary measure on the part of the Government to prevent, as far as the machinery at its disposal will allow, the vesting in

one patentee of a right which might really be the property of a prior patentee or of the public.

The ease with which men can be gulled by patents engenders the belief that a large portion of our people think all patents are about alike, whereas there can be no property more diversified than patent property.

The dealer exhibits his patent deed, the proposed purchaser notes the neat-looking document, a seal, and formidable-looking grant on the first page, with the signatures of prominent officers of the Government, a drawing of the machine inside, and a printed description ; surely this document, the solemn act of the Government, must be all right. He believes that whatever is shown in the drawing is included in the patent ; he does not understand the nature of the claims ; he is not aware of the fact that the part covered by the patent is a mere fraction of the machine which the drawing exhibits, that it is very doubtful whether the thing covered is, in fact, an improvement ; that the patent may be so subordinate to prior patents that it cannot be used without infringing the rights of others ; he does not know that the claims may be so weak that his neighbor could manufacture the same machine, with a slight and unimportant alteration, perhaps an alteration for the better.

Of course every victim imbibes a bad opinion of patent property, and he and his immediate neighbors conclude that the whole system is a humbug ; the impression spreads, the member of Congress gets the

same notions from his constituents, and the crusade against patents and inventors is inaugurated.

It must be said, however, that this ignorance of the true character of patents does not prevail to anything like the extent it formerly did ; the public is gradually acquiring a fair knowledge of the subject, as an intelligent people are sure to do on any subject which concerns their interests.

The official gazette published by the Patent Office has had much to do with this.

The increased number of applications to the Patent Office for copies of patents, documents relating thereto, and for briefs of title, indicate a more wholesome condition of affairs in this respect than ever existed before, but there is need of still more general enlightenment.

The following circular, recently issued by the Commissioner of Patents to the Examiners, will have a most salutary effect in tending to enlighten the public as to the character of patents.

WASHINGTON, D. C., January 15, 1878.

In the present condition of the Patent System, with great numbers of Patents issuing every year, I am impressed with the conviction, that more and more care ought to be exercised by Examiners in requiring applications for mere improvements to be distinctly defined from generic inventions, and that applicants should discriminate between what they claim as new, and what they deem to be old.

The remarks of the United States Supreme Court in the recent cases of *Merrill vs. Yeomans*, 11 O. G. 970, and *Keystone Bridge Co. vs. Phoenix Iron Co.*, 12 O. G. 980, plainly indicate the duty of the Office in this regard.

It is doubtless a matter of common observation with the Examining Corps that the tendency on the part of applicants for

Patents is to avoid or neglect reference to prior patents upon which their invention is an improvement.

I think much of the odium attached to patents, and much of the injustice and vexation arising from Patents with narrow claims, would be obviated were the applicant compelled to state specifically, where it can be done, on what his Patent is an improvement, and define accurately the state of the art prior to his invention, so that any one reading his patent, even if unskilled in patent matters, would see not only what is claimed, but would see set forth clearly the state of the art upon which his invention was based.

At this time, when patents have been brought into disrepute, principally on account of those of a trivial nature which are used to embarrass persons not able to determine the scope of such a grant, it seems especially necessary that the Office should exercise great caution in this respect.

ELLIS SPEAR,

Commissioner of Patents.

The strict observance in the Patent Office of the Commissioner's order as given above, must have a good effect; for when the purchaser, on reading the specification, comes to the words, "I do not claim," etc., he naturally hesitates, and the words may induce him to look further before purchasing.

It unfortunately happens, however, that the Commissionership of patents frequently changes hands, and the next Commissioner may take an entirely different view of the law, as it stands, from that entertained by the present able holder of the Office, and may promulgate new rulings: hence new legislation may be desirable.

The average patent does not state how much of what is shown in the drawing, and described in the specification, is not the invention of the patentee.

It may be said that the claims define the scope of the invention, but how many people understand the meaning of the claims, and their relation to the other parts of the specification? It is the commonest of all mistakes, for a man who peruses a patent, to think that it gives the right, not only to what is claimed, but a right to use all the other parts shown in the drawing, and he may purchase the patent under this belief, only to find that he is trespassing on some one else, and that the thing he has bought is absolutely locked up and beyond his reach.

Every patent issued should be self-interpreting; its true scope and character should be exhibited on its face, and not require the interpretation of a skilled expert. A professional schemer always tries to get a patent which appears on its face to cover more than it actually does—a deceptive patent. But if he is compelled to say in his specification what he does *not* claim, how much of what he shows in the drawing belongs to a prior patentee, how much belongs to the public,—and all this can be done in the most brief terms, a single sentence generally sufficing,—the wings of the schemer would be clipped.

The victimizing of inventors themselves, by the issuing to them of patents, of the character and scope of which they have little or no knowledge, is a more formidable evil than all, and one which demands prompt and decisive action at the hands of the authorities.

Of the two hundred and fifty inventors who receive official notice of allowances of patents weekly, how many are there who know what kinds of patents they are to receive on the payment of the second fee (\$20) ?

Of the two hundred and fifty inventors who become patentees weekly, how many are there who have a wholesome knowledge of the true character of the patent deeds which they receive ?

I shall be giving a very liberal estimate when I answer these questions by saying not more than twenty-five per cent.

There is no reason why any inventor who has received a notice of the allowance of a patent for his invention, should be ignorant of the kind of patent he will obtain on the payment of the second fees ; there is no reason why any inventor, who obtains a patent, should be ignorant of its true character.

That the majority of patentees are thus ignorant, however, is as certain as that much of the unpopularity of patents is due to this ignorance.

It is no part of the duty of the authorities of the Patent Office to notify inventors of the purport and scope of the claims which have been allowed. The Patent Office cannot undertake to counsel inventors on these points, all that it can do is to examine the applications and decide on the patentability of inventions, as described and claimed by the applicants.

Without desiring to dictate to patent solicitors how they should perform their duties, I cannot resist this opportunity of giving a little advice to inventors, and of expressing my belief that if they were always treated with candor, and made participants in the prosecution of their applications for patents, there would soon be less ignorance among them than there is as to the true nature of patent property.

Inventors may save themselves from the many pitfalls which beset them as patentees, and may acquire much salutary information by observing the following instructions :—

Never sign blank petitions for applications for patents ; insist upon examining the specification and drawings before the application is signed and filed, noting especially the character of the claims. You may be told that you cannot understand them ; but you have at least a right to try and understand them, and if you cannot, your attorney ought to explain them. Keep a copy of the specification, or at least of the claims ; and bear in mind that the protection you acquire by a patent will depend upon the claims which are allowed. If you ask the Government for less protection than you are entitled to, the officers of the Government cannot undertake to notify you that you have not done yourself justice ; they will take care that you do not get more than you are entitled to, but it is your own fault if you ask for less. After your application is filed, insist upon knowing every step taken in the prosecution of the case. If the application is rejected, in view of prior patents, insist upon having a copy of the

official letter and particulars of the prior patents referred to, and of such changes as the attorney proposes to make; you have a right to an opinion of your own as to the character of the references, which may not have the bearing on your case which the Examiner or even the attorney supposes. Bear in mind that the prosecution of the case, after rejection, is the most important duty of all, for any neglect might result in the granting of a patent with narrower claims than you are entitled to. When the case is allowed, insist upon having a copy of the allowed claims, which, with the copy of the originals, and of letters of rejection and references, will give you a pretty clear idea of the kind of patent you will receive on the payment of the second fees, and you will have acquired some information of the character of patent property generally, as well as of your own patent property in particular.

No respectable attorney can refuse to comply with such demands as I have mentioned; indeed, the practice is adopted to a greater or less extent in all our cities; it is a practice which experienced inventors and those who have most at stake in patent property insist upon, and it is a practice which can be carried out with comparatively slight effort,—it is an honest and wholesome practice.

Let us note for a moment the evil effects of a weak patent in the hands of a man who is ignorant of its weakness.

The inventor is always sanguine: much of his time has been consumed in devising the machine for which he intends to ask a patent, his neighbors take an interest in it, he looks forward to ample reward, perhaps to a fortune; he cannot believe that any one has been in advance of him in this particular device; he gets his patent, is more dazzled by its aspect than concerned about its contents, he has received no papers by which he, or those whom he might desire to consult, can interpret the deed.

He leaves his employment, or gives up some business, by which he has supported his family; relatives and neighbors advance money to help in the manufacture; he sells an interest in his patent for more money, and finally gets the machine into the market and there is every appearance of future prosperity. Some rival manufacturer notes this, steals the invention, adopts all the improvements, acquired by industrious tests, and sets the patentee at defiance; the latter becomes indignant, takes legal advice, and it is suddenly discovered that the patent is a fraud, and the patentee finds himself in debt, his original business ruined by neglect, and is altogether in a deplorable condition. Maybe, after his efforts and borrowings to put the machine into market, he finds that he is trespassing on the rights of others.

As this sort of thing is and has been going on all the time, in all parts of the country, it is not to be wondered at that patents are looked upon with suspicion, and that inventors are mistrusted.

While this state of affairs may be in a measure attributed to the deceptive appearance of patent deeds and especially of the title-page, it has been largely brought about by patent solicitors.

It must be borne in mind that all sorts of people have adopted the profession of soliciting patents; there is as yet, unfortunately, no law to prevent incompetent men from volunteering to advise inventors. The lawyer is an officer of the court in which he practices, by right of admission to the bar after examination as to his competency. The physician can point to his diploma, which is some proof of his competency. But any one can become a patent solicitor by the simple adoption of the title.

It is not to be wondered at, therefore, that no profession in the world contains such a heterogeneous collection of good, bad, and indifferent members, as that of soliciting patents.

While there has always been a demand for the services of solicitors of a higher grade, whose fees are commensurate with the ability and honesty with which their duties are performed, there has always been a struggle among those of a lower grade for the patronage of inventors, and competition resulted in the offer of services for all sorts of prices, culminating at last in the contingent, or no-patent-no-pay system.

If all patents were in quality alike, if applications for patents were equivalent to applications for pensions, in which the mere clerical duty of filling up printed forms is involved, there might be some shadow of an excuse for this kind of practice.

Unfortunately there is a large portion of the community who really think that there is very little difference in the quality of patents, and that the duty of procuring them is a mere matter of form.

The procuring of patents is thus placed on a level with the obtaining of objects by hunting for them at the expense of physical exertion, with a little chance to give excitement to the occupation, like the catching of fish, the shooting of ducks, etc., for which there is generally a stipulated market price, and which are not paid for until they are caught.

The quality of patents, the whole interests of the inventor, depend upon the intelligence, experience, and faithfulness which are brought to bear on preparing and prosecuting the application, and especially on the candor of the attorney in keeping his client informed as to the progress of the application, and advising him of the true condition of the patent which is obtained, and of his rights under the patent. Chance or luck has nothing to do with this duty, the proper fulfillment of which requires intellectual labor and honesty.

The contingent fee practice was denounced by Commissioner Fisher in appropriate terms in his report for 1869; it is a bad system, bad for inventors, bad for the Patent Office, bad for the public. It has been one means of flooding the country with bad patents, creating discontent among inventors, and prejudice against patents in the public mind, and has degraded a profession, in the proper exercise of which

diversified talents, prudence, experience, and integrity are demanded.

In far too many cases the applicant never knows what sort of a patent he is going to have until he gets the deed, and it may be long after that, and after he has spent his own money, and borrowed from others, to manufacture the invention, that he learns how valueless the patent is. He may write indignantly to his agent, from whom, however, he can get very little comfort, or he may write directly to the Patent Office, complaining of the manner in which he has been treated, but the Office is helpless. A patent has been granted, for what the applicant has asked for through his agent: if the agent has not asked for enough—has not prosecuted the case properly—the Office is not responsible.

To give a man a patent without instructing him as to its true purport, or without ever giving him the means by which he can form some opinion as to its scope, is antagonistic to all our ideas of fair professional practice.

The records of the Patent Office will show that complaints about the defective character of patents are made daily, and so serious has the matter become, that some interference on the part of the Government is imperatively demanded. It has been suggested that the Commissioner should mail directly, to every applicant for a patent, whose case has been allowed, a copy of the claims on

which the allowance is based. This would have a beneficial effect, for the copy would at least give the applicant some idea of the sort of patent he will receive on payment of the fees, or it will enable him to consult others who may have more knowledge than himself of patent matters.

Solicitors who perform their duties properly, would not object to this, and if any men objected to it, it would only be evidence of their desire to shirk their duty.

The issue of worthless patents, however, is not entirely due to the ignorance of inventors.

There are many professional schemers who know a good patent from a bad one, and a wretchedly weak claim from a substantial one; these men are always in a hurry and instruct their attorneys to get a patent with any kind of a claim; they want to get the patent cheaply and to trade with it, and they are prepared to pass off a bad one for a good one, just as readily as any other unscrupulous traders pass off spurious articles on their customers.

Against the wiles of these parties, the only efficient guard is to develop every conceivable means of educating the public at large in regard to patent matters.

Another way of remedying the evils above referred to is that suggested by the Commissioner, of dispensing with models in all but exceptional cases. Models are rarely accurate representations of the

machines or devices for which inventors seek patents, they are not necessary for the use of the Patent Office, they occupy room which might be devoted to much better purpose ; but they are very convenient things for enabling attorneys with very limited acquirements to perform their duties in a very clumsy way.

A drawing is made from the model, all the defects appear in the drawing, some kind of specification is easily written by a very inexperienced hand, with the model before him.

A man who cannot perform his duties without the aid of a model is not fit to be a patent solicitor ; abolish the model system, and we shall soon see an improvement in the class of professional men who undertake to advise inventors. It is to be hoped that the petition of inventors, now before Congress, to do away with models, may have the effect of directing our legislators to this important subject.

XIV.

THE ABUSE OF REISSUES OF PATENTS.

A MERCIFUL clause in our patent law is that relating to reissues, which allows the patentee to repair his patent, not by the introduction of new matter, but by such alterations of the specification and claims as the defects, in the original deed, and the state of the art when the patent was granted, may suggest.

It would be a mistake to deprive of this right a patentee, who, through no direct fault of his own, has obtained a patent which does not afford the protection he was entitled to.

It has been said that a patentee should be held responsible for his own acts; that the protection he asked for was defined by himself; that if he did not ask for better protection or employ a competent man to make the request in proper form, no one is to blame but himself; that it is not the duty of our lawmakers to legislate for the benefit of the ignorant and careless.

This is not an argument which can find favor in these enlightened times with men of broad views, who would let every man have a chance of repairing the errors he may have inadvertently committed, pro-

viding this privilege does not injuriously affect the public.

Like other beneficent measures, however, this privilege of reissuing patents has been grossly abused, and has brought our patent system into such disrepute, that remedial legislation is imperatively demanded.

Let us note some of the evils resulting from the abuse of this clause of the law.

A patent, or series of patents, relating to some special branch of industry, has been obtained, and capital has been invested in the manufacture of the patented articles. Now in these days the simplest objects of every-day use cannot be economically manufactured without an outlay for machinery and appliances, and for carrying into effect a proper system of division of labor; the public demands not only new things but better things and cheaper things, and this demand can only be supplied by patents, and by the capital which patents invite. The remarkably cheap products of our workshops at the Centennial Exhibition were matters of surprise and astonishment to our visitors from abroad, where labor is much less expensive than in our own country.

The factory, based on patents, is in full and successful operation, the proprietor is receiving a fair interest for the capital invested, and the public has the benefit of cheaper and better articles in return for the protection afforded by the Government, in the shape of patents.

The success of the establishment cannot remain a secret, and it attracts the attention of a patent speculator, whose first move is to try and get hold of some patent preceding those which are owned by the proprietors of the establishment. Failing in discovering a patent to exactly meet the case, he takes an excursion to Washington, probably takes the advice of a solicitor there, to whom he explains what he wants, and together they go on a hunting expedition through the records and model halls, until they find some model of a patent which they think can be doctored by reissue to resemble a subsequent prominent patent of the manufacturer. The model has, perhaps, long since been almost forgotten by the inventor himself, and has remained on the shelves of the model room without attracting any notice. By cunning manœuvres, the patent to which the model appertains is purchased from the owner, perhaps for a mere song, and then commences the operation of reissuing ; the attorney has the copy of the recently discovered patent before him, and also a copy of that for the coveted machine of the successful manufacturer, and he is told that he must reissue the first patent so as to cover, or to use a common phrase, wipe out the second.

The most ingenious devices are adopted to bring this about,—the attorney receives high fees, and the Examiner is cajoled by all sorts of assertions into allowing claims which may appear to be innocent enough.

The reissued patent is shown to the manufacturer, and he may be induced to purchase it for a large sum

in order to avoid expensive litigation. Now this money is taken from the public to enrich the speculator, the non-producer, for to make up for the withdrawal of capital the price of the product is increased. Perhaps the manufacturer resists the demand made on him and costly litigation ensues, the economy of the manufacture is disturbed, and the public and manufacturer suffer for the benefit of the owner of the reissued patent.

A lot of these speculators, lawyers and patent solicitors sometimes among them, club together to buy up a patent or patents relating to something in general use in different parts of the country, subject their purchases to the reissuing process, establish headquarters, and, with a great flourish, proceed to levy on manufacturers who were ignorant of the existence of the patent which has been reissued, and which would doubtless have been forgotten, but for the keen eyes of these speculators.

The evil wrought by this system is incalculable, it not only disturbs the economy of manufactures, but brings disgrace on the whole patent system. A reissue of this character cannot promote the progress of the useful arts, it must necessarily obstruct that progress.

It may be said that in the hands of a rival manufacturer the reissue might create a competition which would be advantageous to the public, it might have the effect of reducing the cost of the product for a short time perhaps; but manufacturers are generally cunning enough to join hands eventually, and agree to keep up prices, as the saying is, and this keeping up

of prices means charging such sums for the product as will pay them for the cost of litigation.

The evil has at last attracted the attention of our legislators, and many remedies have been suggested.

One proposition is, to abolish reissues altogether, which would be unjust to honest patentees, who want honest reissues. Another plan is to forbid the reissue of a patent after it is five years old, but this again might work a great injustice to an honest inventor, who has been working under his patent for several years, to his own advantage, and that of the public, and suddenly discovers that to meet the inroads of sharpers he must obtain a reissue.

There appears to be a more satisfactory way of remedying the difficulty.

Compel an applicant for a reissued patent to file with his application a statement, under oath, setting forth clearly wherein the patent is imperfect and defective; compel him also to present the testimony of disinterested witnesses, setting forth what efforts, if any, have been made to introduce the invention into the market; let the Examiner to whom the case is referred prepare a report, to be submitted to the Commissioner, who, alone, should have the right to grant the reissue.

If it shall appear to the Commissioner that the claims presented with the reissue might have been granted when the invention was originally patented, and that reasonable efforts have been made to introduce the invention into the market, let the reissue be granted; but should it appear that, even if he might

otherwise be entitled to the reissue, he has made no effort to introduce the invention, or has only made a late effort for the purpose of securing a reissue, then the application ought to be denied.

The law favors the industrious, and will always make a distinction between the active and the indolent inventor.

The man who obtains a patent and takes no steps to develop the invention and carry it into practical effect, is not worthy of much consideration—he has contributed very little to the progress of the useful arts; and the man who, with a dead patent, is actuated by jealousy of a rival and more active inventor to resuscitate that dead patent, and by a deceptive reissue converts it into a weapon to harass his rival, is the worst kind of obstructionist, and should find no favor.

The plan suggested above is substantially the same as that formerly adopted in treating applications for an extension of patents, which had been granted for fourteen years. It was the invariable rule for the Commissioner to demand proof of activity in introducing the invention into public use, before the application could be favorably considered.

The model halls of the Patent Office are the special hunting grounds for speculators, who resort to this reissuing business, and models have been altered and distorted, so as to form the foundation for reissued patents, and on the strength of what appears

in the model, or what is, by some rascality, made to appear in it, reissued patents have been granted for what the original patentee never contemplated. Of course, every such reissue is a fraud on the Government and the public, and a curse to manufacturers who are pursuing a legitimate business.

It is still the custom to permit applicants for reissued patents to claim all that appears in the model, which forms no part of the patent, and with which the public is not familiar.

It is gratifying to know that the Commissioner of Patents, in his recent report, and in his suggestions to the Senate Committee on patents, recommends that this abominable custom be abolished; indeed, he recommends the abandonment of the model system, excepting in very special cases.

Two-thirds of the models in the Office are abortions, and better calculated to distort the imagination than to convey any clear and precise idea of the machine or device they misrepresent.

Models are of no use to the Examiners, they are a useless tax on inventors, and the solicitor of patents who cannot do without them has no business in the profession.

There is no difference of opinion among the best authorities as regards the evil attending the reissuing of patents as now practised, but any such radical change as would prevent the honest repairing of a bad patent would be a great misfortune.

It is believed that the plan suggested above, of abolishing models altogether, excluding all reference to such models as exist from reissue applications in future, and surrounding such applications with requirements rendering exceedingly difficult the obtaining of unjust reissues, would be desirable amendments of the present system.

Another class of speculators of a lower grade, the peddlers who pass off weak patents for substantial ones, are not so numerous as they formerly were, a certain sign that the public is being slowly educated to a proper understanding of patent property;—when the means suggested above of completing this education have been carried into effect, the peddling of bad patents will soon cease to be profitable.

In a bill now before Congress, it is proposed that a tax of \$50 shall be levied on every patent when it is four years old, and another tax of \$100 when it is nine years old; the patent being considered as abandoned on failure to pay these taxes. This would appear to be a wise measure, as it will abolish many worthless patents which are in the way of actual improvements—are positive obstructions, and might be used for the worst purposes.

Other proposed modifications of the law have been recently considered by the Committees of the Senate and House of Representatives; some of them appear to be based on the supposition that inventing should be considered a penal offense; others, again, appear

to be of a salutary character, but it will be out of place to discuss them here, especially as they have received the attention of learned and able men, whose views have been published.

I have endeavored, in a sketchy way, to show in the foregoing pages how almost from the very dawn of practically applied science, there has been the most intimate relationship between patents, the progress of the useful arts, and the advancement of civilization; how the relationship can be sustained and even more closely knit, by prudent and simple measures directed against the evils of our patent system, where they exist, and how fatal to our future prosperity would be the rude severing of the alliance, by a removal of the incentive to invent. We know what this incentive has done for us in the past. Who can predict its results in the future?

"Whoever imagines that, because so many inventions and so many improvements in machinery have been made, there remains little else to be discovered, has but a feeble conception of the infinitude and vastness of mechanical powers, or of the unlimited

reach of science. Much as has been discovered, infinitely more remains unrevealed. The ingenuity of man is exploring a region without limits, and delving in a mine whose treasures are exhaustless." "Neither are all the mysteries of nature unfolded, nor the mind tired in the pursuit of them."

S U P P L E M E N T .

JUST as the foregoing pages were leaving the hands of the printer, the writer received a copy of a report, submitted to the Senate by Senator Wadleigh, of the Committee on Patents, to accompany Bill 300.

As this very able report was prepared after "a long public hearing, during which arguments were presented on the whole subject of the patent law," the following extracts will be worthy of the reader's attention :

" In coming to a result, the committee have been impressed with the importance and value of the patent system in promoting the progress of the useful arts. Those nations which have most excelled in the extent of their manufactures and in the wealth derived from them, which have carried the industrial arts to the highest perfection, are the nations which have possessed and have developed efficient patent systems. Those regions which exhibit bodies of the most highly skilled and most intelligent workmen, are the regions which have been longest and most affected by the educating and stimulating effects of the law reaching the ranks of the actual working classes. The industrial arts have grown as and where the patents have most grown, not only as between different countries, but as between different parts of the same country. In

the United States most of the patents were taken out in New England, and most of the manufacturing was done there thirty years ago; to-day the six great Western States take out fifty per cent. more patents than New England, and surpass it in the value of their manufactured products. We have come to be a great manufacturing nation. As long ago as 1870 the yearly product of our manufacturing establishments was nearly twice the value of all our agricultural products, and the wages of the operatives were greater than the labor earnings of all farmers and farm-laborers, including their board. The manufacturing product and wages exceeded those of agriculture even in the great corn and grain growing States of the West and Northwest, while our exports of industrial products exceed our exports of breadstuffs. That we are equaling and surpassing England in excellence and cheapness, and thus gradually driving her manufactures not only out of our own but out of neutral markets, is shown by the tables of exports and imports of the two countries, and by those facts, in the course of trade, which come to our daily notice. All this gain has for its essential condition, economy of manufacture by means of labor-saving machinery to compensate for the higher wages which prevail, and which it is desirable shall continue to prevail in this country.

"Indeed, not only the experience of our own manufacturers and exporters, but the universal testimony of the industrial writers in the English journals, and elsewhere, and of our own consuls, set forth in the "commercial intercourse" appendix to the papers relating

to foreign relations, transmitted to Congress with the President's message of last year, show that this progress is owing to the improvement in accuracy and quality, as well as the diminution of cost of manufacture due to our improved machinery, and abundant instances of this have been furnished in industries whose development is directly due to recently invented and still patented machinery."

" These and many other considerations show that the patent-system is one of the great factors in our industrial progress, and it is significant that the Commissioners of foreign nations present at our Centennial Exhibition, struck with our superiority in machinery and mechanical tools, attributed it in large part to the fostering effect of that system. They advised their governments to take steps to create or modify their patent laws to conform more to ours, the distinctive feature of which is that it is so framed and so administered that its stimulus reaches every workshop. Nearly all of our mechanical inventions are made by working-men; and thus we have not only acquired a large mass of useful inventions, but have trained the whole body of our workmen to use their brains as well as their hands."

" It has been abundantly shown also that the direct effect of the system is to improve the condition of the workman. Statistics from the census and figures from the books of those engaged in various branches of industry, prove that with the introduction of improved machinery the hours of labor have been shortened, and the daily rate of wages raised, while the cost of

the product to the consumer has been lessened. The day of the workman has been made more valuable to the community, and represents a larger and more valuable product; and he has consequently, and in fact, enjoyed more of the comforts and conveniences which the higher value of his labor in proportion to the things he desires has enabled him to acquire. Meantime the demand for labor, as a whole, has increased. Financial depression affects everything to-day; but looking at the community at periods of ten years apart, we find that during the period of the great growth in inventions, 1850 to 1870, while our population increased sixty-seven per cent., the workmen employed in manufacturing more than doubled, those employed in steam transportation increased many fold, while in the great grain-raising States, most affected by the introduction of labor-saving agricultural machinery, the farmers and farm-laborers more than doubled. So much does the cheapened product increase the demand and the ability to consume.

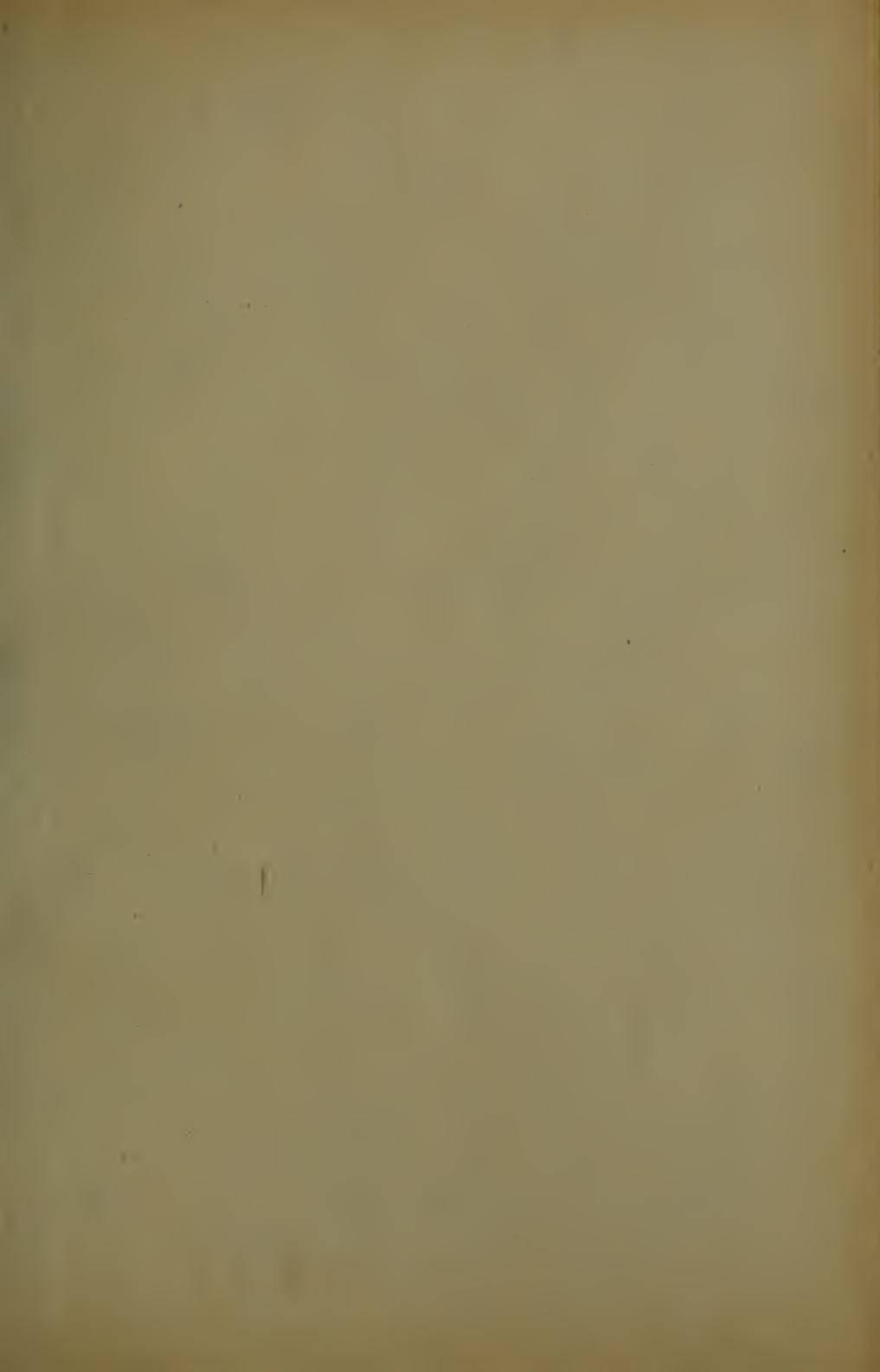
"The consumer has gained not merely by the diminished cost due to the use of the invention after the expiration of the patent, but by an immediate cheapening, for it has been shown by figures drawn from many branches of industry that the royalties commonly received seldom exceed five per cent. of the actual saving immediately realized; so that, if an invention cheapens the product one dollar, the patentee generally receives five or ten cents of it, and the community at large gains the rest.

"The workman finds that by means of his patent which he can either use or sell, he is enabled to hold his own to a greater or less degree against the capitalist in industrial competition ; and, more than all, the protection which the patent gives a patent-owner in the results attained induces him, and is all that will induce him, to expend the time and the money—often several hundred thousand dollars upon a single machine—in perfecting the invention, embodying it in a practically useful machine, and introducing it to public use.

"The committee are therefore convinced that the framers of the Constitution were wise in their judgment when, in intrusting to Congress 'the power to promote science and useful arts,' they gave them only one means for doing it, namely, 'securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.' No change should be made in the patent law to weaken the inducement which, in its ordinary and normal operation in the common transactions of business, it offers to those who will successfully invent, and to those who, by perseverance and expenditure, will perfect inventions and the machines in which they are embodied, and push their introduction so as to put the public in possession of perfectly working machines or a perfectly finished product."

INDEX.

	PAGE
INTRODUCTION -----	7
I.	
Early Practical Science and Early Patents -----	9
II.	
Inventors and Their Motives -----	17
III.	
The Steam-Engine—Early Patentees -----	21
IV.	
Textile Machinery—Early Inventors and Patentees -----	28
V.	
Early Patents for the Manufacture of Iron and Steel -----	35
VI.	
Early Patents and Manufactures in the United States -----	38
VII.	
Useful Arts in France Prior to 1800 -----	50
VIII.	
Patent Laws in Europe -----	54
IX.	
Patents and Manufactures in the United States after 1800 -----	61
X.	
About Inventors and Their Trials -----	73
XI.	
The United States Patent Office—Its Early History -----	82
XII.	
The Examining System—Its Past and Present Condition -----	85
XIII.	
Present Mischiefs Attending Patents and Remedies Therefor -----	98
XIV.	
The Abuse of Reissues of Patents -----	115
SUPPLEMENT -----	125



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